Canadian Information Services Market

Five-Year Outlook

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June 1996

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- Systems plans
- Peer position

Other Services

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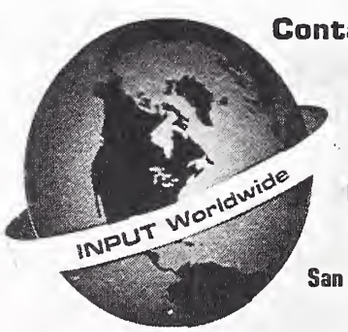

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Abstract

This edition of the annual Canadian report on information services by INPUT focuses on the expansion in vendor opportunities that has taken place in the last year, particularly in the use of desktop services, business outsourcing, client/server applications, and network services, including the Internet. This report provides growth estimates of the use of information services in Canada between 1995 and 2000. Estimates are made for each delivery mode including processing services, outsourcing, applications and systems software products, turnkey systems, network services, and professional services. The report also analyzes expenditures for information services by industry market for a group of markets selected by INPUT after consultation with vendors; markets include manufacturing (discrete and process), finance and banking, insurance, wholesale distribution, retail distribution, utilities, telecommunications, business services, and the federal government. Economic and business conditions in each of these markets are reviewed in relation to the growth in information services expenditures in the market.

Research indicates that the use of information technology increased in 1994 and 1995 due to the growth of the economy resulting from the stimulation of NAFTA. Canadian manufacturing fell back in early 1995 as a result of rising interest rates in the U.S., but recovered somewhat in the third quarter. (Annual results for business in 1995 will not meet expectations, however.) The growth of information services continued throughout the year, driven by needs for cost reduction, increased productivity, and improved customer services. The rate of growth for information services is highest in manufacturing, telecommunications, utilities, and finance and banking.

Research for this report involved interviews with 145 users and 10 vendors about plans for the use of information services as well as the use of secondary sources of research data and contact with industry experts.

The report contains 137 pages, including 106 exhibits.

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Introduction

A
Purpose and Organization

1. Vendor Research Objectives

The purpose of this report is to provide an analysis of vendor opportunities in the information services market in Canada in 1995 together with an estimate of the expenditures made for these services and a forecast of their use in the period from 1995 to 2000. This analysis is presented together with information on the market forces that are causing increases in the use of information services.

Forecasts for the growth of information services cover the use of the following services: processing, including disaster/recovery services; outsourcing, including platform, application, network, desktop services and business outsourcing; application and systems software; systems integration; turnkey systems; network services, including Internet services; and professional services, including consulting, education and software development.

The report includes discussions of recent market issues, technological developments, and trends that have had an impact on the use of information services. Some of the technological issues that are addressed include client/server development and applications, downsizing, scanning, open systems, object-oriented technology and use of the Internet.

The vertical markets that are analyzed in detail in the 1995 report include banking and finance, insurance, manufacturing, wholesale and retail distribution, telecommunications, utilities, business services, and the federal government. The other vertical markets will be dealt with as a combined group under the title, "Other Markets".

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2. Organization

The purpose and organization of the report is described in this chapter which is the Introduction. The remainder of the report and its organization is described below.

Chapter II, Executive Overview, presents a summary of highlights and findings from the report on expanded types of vendor services, changes in budgets and plans for the use of information technology (IT) including projected use of services from 1995 to 2000, and use of information services by vertical markets. Ratings of vendors for specific capabilities are also compared in this section and conclusions and recommendations are developed based on the findings of the report.

Chapter III presents the Market Analysis which analyzes factors that drive or inhibit the use of information services. This chapter also presents totals for expenditures by delivery mode as well as by selected vertical markets. Problems involved with the use of information services are also noted.

Chapter IV, Information Services Use in Industry Markets, analyzes the business forces, technological directions, and expenditures for information services in the vertical markets selected for detailed analysis. A comparison is also made of the use of vendors in these markets.

Chapter V, The Information Services Market, analyzes the use of information services by delivery mode. The factors driving and inhibiting the use of specific services or products are analyzed, and comparisons of the use of products and services in various industry markets are discussed.

Appendix A reviews definitions of terms utilized in this report and changes of terminology that is taking place in the information services industry that are relevant in the examination of this market.

Appendix B summarizes information on the user and vendor respondents contacted in the preparation of this report.

Appendix C contains the forecast database which provides a detailed forecast of information services delivery modes and submodes together with a reconciliation to the forecast prepared in the previous report.

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B
Methodology

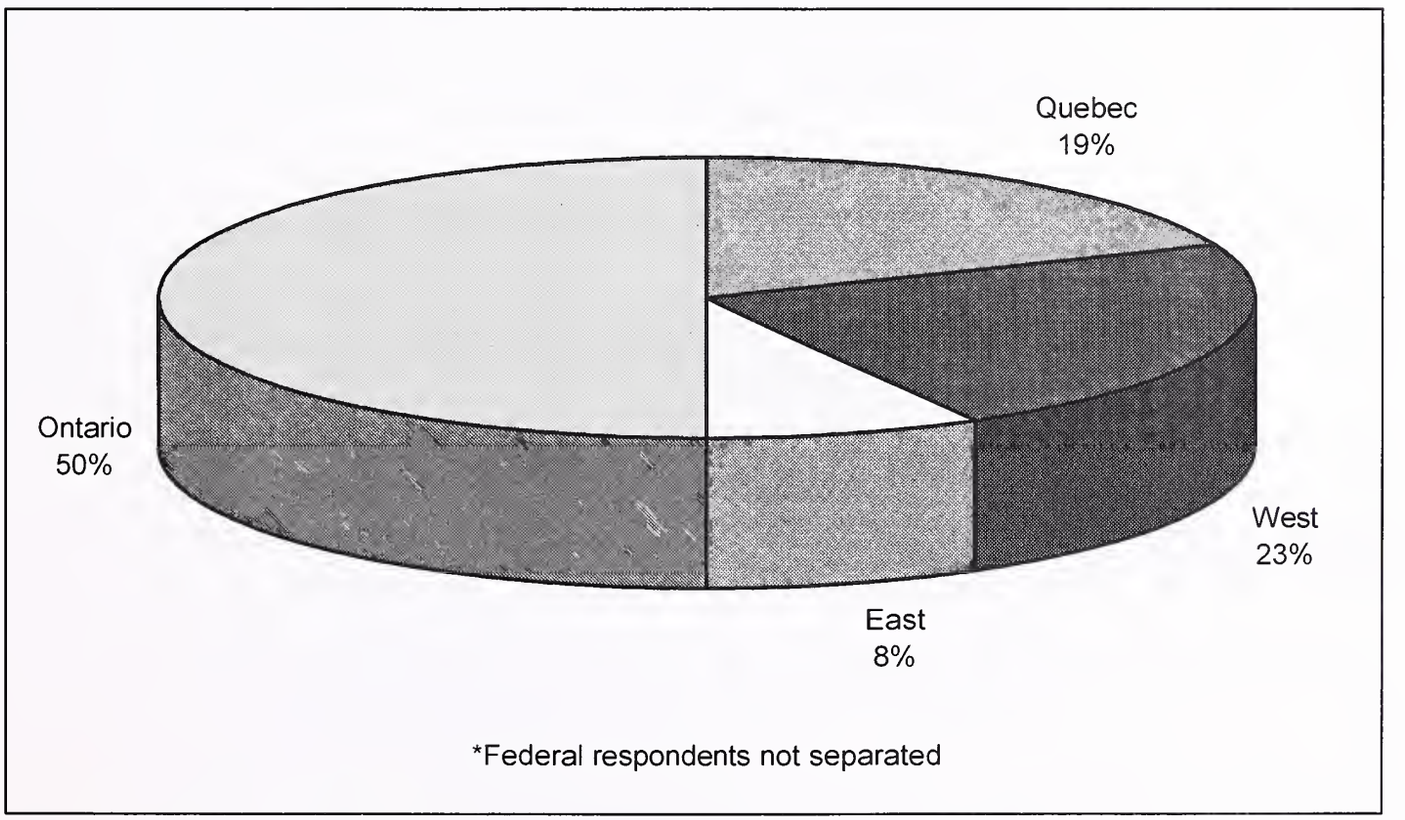
1. Data Gathering

The primary research conducted for this report included interviews with one hundred and forty-five users as well as with fifteen vendors located in Canada who carry out over 60% of their business in Canada.

- The geographic division of user respondents is indicated in Exhibit I-1. Federal respondents were not separated from the regions.
- An attempt was made to have the number of interviews in a region correspond to the percentage of information services business in the region. In conformance with that objective, the number of interviews was greatest in Ontario and smallest in the East.

Exhibit I-1

Geographic Location of User Respondents*



Source: INPUT

Exhibit I-2 indicates the percentage of interviews by industry. The interviews are divided into the industry markets that are reported and analyzed separately and those that are analyzed as a group.

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Exhibit I-2

Percentage of User Respondents by Market Sector

Vertical Market	Percentage of Respondents
Process Manufacturing	15
Finance and Banking	13
Insurance	12
Other, including Federal Government	12
Discrete Manufacturing	11
Wholesale Trade	11
Utilities	9
Telecommunications	7
Business Services	5
Retail Trade	5

Source: INPUT

Secondary research on the Canadian market was also performed with industry experts in Canada and the U.S.

2. Market Assumptions

Economic and financial information required to conduct this market study was obtained from Canadian government sources as well as from industry experts and vendors. A GDP deflator was obtained and utilized to develop the forecasts in the report. The deflator and other market assumptions were reviewed with selected Canadian information services vendors.

C
Other Reports of Interest

- *U.S. Information Services Industry Forecast Report, 1995-2000*
- *Worldwide Information Services Forecast, 1995-2000*
- *Worldwide Banking Services, 1995-2000*
- *European Information Services Industry Analysis and Forecast, 1995-2000*

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II

Executive Overview

A
Environment for Use of Information Services Vendors

1. Business Forces

The business and economic factors that Canadian business organizations report having an impact on the use of information services reflect the continuing importance of the NAFTA agreement (See Exhibit II-1). As the Wall Street Journal noted on 8/6/95, the Canadian economy was running high in 1994 on the basis of the strong orders from the U.S. for autos, lumber, computers and other goods.

- The boom in business resulting from NAFTA in 1994 led to growth in automation to support manufacturing principally but also stimulated more use of automation in banking and finance, utilities, telecommunications, and other industries. The momentum from 1994 continued into early 1995 according to many users and vendors.

- The fall in demand from the U.S. following the increases in interest rates by the Federal Reserve in early 1995 was a disquieting factor, but it abated by the third quarter. The low exchange rate and stable and low cost of labor has made Canadian manufactures cheap in the U.S. market.

- Trade has increased with other countries in Europe and Asia, but the volume of trade with the U.S. is many times larger.

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Exhibit II-1

Business Environment

Factor	Relative Importance*
Impact of NAFTA	4.3
Impact of New Information Technology	4.0
Need for Improved Service	3.9
Need to Reduce Costs	3.8
Federal Budget and Taxes	3.6
Limitations in Funding Automation	3.3

** Rating: 1 = Low and 5 = High,* *Source: INPUT*

In addition to foreign trade, there are domestic economic issues which are impacting use of information services.

- A fall off in consumer demand in Canada in 1995 had an impact on Canadian industry and could lead to reductions in business plans and a corresponding fall off in investment in business, including investment in IT.

- Canadian businesses also report that the tax burden is still a discouraging factor which could have a negative impact on investment in automation or other business functions. A campaign against tax increases by the Canadian Taxpayers Federation, the Vancouver Sun, and other organizations intensified in early 1995.

- However, users report that advertisements, articles and reports from other users about the availability of new or improved IT products and services are encouraging them to make greater use of services and vendors. The specific services and products mentioned by respondents included back up and recovery services; new network services, and particularly, the Internet and desktop support; business outsourcing; BPR; and new application capabilities on client/server systems.

In this type of environment, IT vendors should bring their capabilities to the attention of prospects and companies that might be considering further automation to support business goals. Several respondents reported that aggressive moves by vendors to promote use of outsourcing, disaster recovery, and SI in complex applications led to the use of vendor services.

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2. Market-Related Factors Impacting Information Services

The business and economic forces that users of information services report as driving the expenditures for information services have some similarities across industries (See Exhibit II-2).

- The need to achieve cost reduction and greater productivity as well as the need to deal with new technology (particularly networking) are identified in many industries as forces that can increase the use of information technology. These forces are caused partially by a need to lower cost so that firms can gain market share through lower pricing as well as by a response to falling or uncertain demand which could endanger profits. Uncertain U.S. demand and falling consumer demand in Canada are supporting moves to reduce costs so as reduce prices.

- The need to stimulate demand is also fueling the desire to improve automated systems in a number of industries. This is resulting in moves to improve handling of orders and support for customer service. Several respondents noted that these improvements are also driven by the desire to be more competitive.

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Exhibit II-2

Factors Affecting Key Market Sectors

Industry	Key Factors Reported by Respondents
Manufacturing	• Cost pressure • Use of client/server technology • Impact of NAFTA • Need for increased productivity • Tax burden
Banking/Finance and Insurance	• Lending opportunities • Pressure to cut costs • Need to reengineer systems • Need for client/server technology
Wholesale Trade	• Pressure to cut costs • Increased trade opportunities • Need to expand client/server use • Need to increase productivity • Need to upgrade service
Federal Government	• Need for automation upgrade • Very tight budgets
Utilities and Telecommunications	• Pressure to increase productivity and cut costs • Need for improvement in customer service • Need to upgrade/reengineer systems • Need to use new IT • Regulatory changes/actions

Source: INPUT

In many industries, users report a strong desire to find application solutions for client/server technology that include integrated functions. Several respondents spoke of the need in relation to the integration of client/server applications across a group of departments. This desire is supporting the appeal of the R3 system of SAP and vendors who can support implementation and modification of it, particularly for process and discrete manufacturing and utilities.

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In a number of industries, there are specific needs which are driving use of information services.

- The banking and finance market has been encouraged to improve IT capabilities to meet growth in domestic and international lending. Pressure to cut costs and reengineer systems and interest in expanded use of electronic banking are also stimulating increased use of IT. The demand for electronic banking is mostly concerned with expanded use of home banking and ATM systems, but use of the Internet and other networks to deliver banking services were also mentioned.

- Increased trade has had a positive impact on the use of IT in wholesale distribution to improve ordering, inventory control and supply or traffic systems. Pressure to cut costs and increase productivity as well as the desire to improve customer services and upgrade use of client/servers are also generating increased use of information services.

- Although budget constraints are having a negative effect on increased use of IT in the federal government, there is increasing pressure to upgrade or change IT applications and utilize new technology.

- The pressure to increase productivity and cut costs as well as to improve customer service remains strong in the utility and telecommunication industries as factors driving the use of IT. Interest in reengineering and use of client/server and new network technology are also encouraging expanded use of information services.

The specific information services including software products that are called upon to support these needs are discussed in Chapters IV and V.

3. Impact on Information Technology Budgets

Despite the recessionary factors present in the Canadian market, a majority of IT users and vendors expect the use of information services to increase. Moves being planned by IT users to reduce costs, increase productivity, and take advantage of new technology are accompanied with an expectation that overall expenditures for IT will increase in 1995 versus 1994 (See Exhibit II-3).

- The growth forecast in 1995 vs. 1994 has increased relative to the growth forecast in 1994 vs. 1993.

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- The growth for larger respondents has increased by a greater percentage compared to respondents from smaller companies since interest in restructuring or reengineering business has grown more rapidly in larger companies.

- There is also more interest by larger companies in using additional vendor capabilities including business outsourcing, network management, desktop services, network services and backup/recovery.

- Overall budgets for IT are expected to increase over the next five years by a compound growth rate at least as great as the average increase experienced in 1995 according to respondents.

Exhibit II-3

Growth Forecast in IT Budget in 1995

Forecast	Increase 1995 vs. 1994 (Percent)
Average Growth Forecast by Largest Organizations (> $1 billion Canadian in annual revenue)	7.5
Average Growth Forecast by Respondents	7.1

Source: INPUT

The differences among growth forecasts for IT budget in 1995 by region are shown in Exhibit II-4. These forecasts include budgets for IT equipment, staff, and internal costs as well as expenditures for information services.

- The growth that is forecast is slightly higher for the Western Region where new and growing business in energy, mining, and manufacturing is driving an expanded use of IT. In this geographic area, the expansion of infrastructure, retail, and services business is also creating need for more automation.

- The growth of IT budgets is also high in Ontario where manufacturing, particularly for export, as well as banking, distribution, telecommunications, and utilities are undergoing expansion that requires increased use of IT. Banking is also being stimulated in Ontario by the demand for more retail electronic services as well as by corporate demand for services to support trade.

- Quebec is also experiencing growth in manufacturing, distribution, telecommunications and utilities that is increasing the need for IT capabilities.

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- Respondents in the East do not report as high an increase in IT budgets as users in other areas. Economic growth in this region continues to lag according to industry experts.
- Increases in IT budget will also be relatively high in banking and finance to support improvement in lending, trading, and electronic banking applications as well as increasing use of client/server technology and outsourcing, according to respondents.
- Wholesale distribution budgets for IT are impacted by plans to reduce costs and improve service as are budgets for many other industries.

Exhibit II-4

Forecast IT Budget Growth in 1995 by Region

Region	Growth Increase in 1995 (Percent)
West	8.3
Ontario	8.2
Quebec	7.5
East	4.5

Source: INPUT

Forecast of IT budget growth that respondents expect to incur in 1995 are compared, in general, by industry in Exhibit II-5. Plans for investments in IT are high in a number of industries.

Exhibit II-5

Forecast IT Budget Growth in Key Market Sectors

Market Sector	Forecast Budget Growth (Percentage)
Manufacturing	15
Telecommunications	14
Finance and Banking	12
Utilities	12
Business Services	10
Wholesale Trade	10
Insurance	10
Retail Trade	6

Source: INPUT

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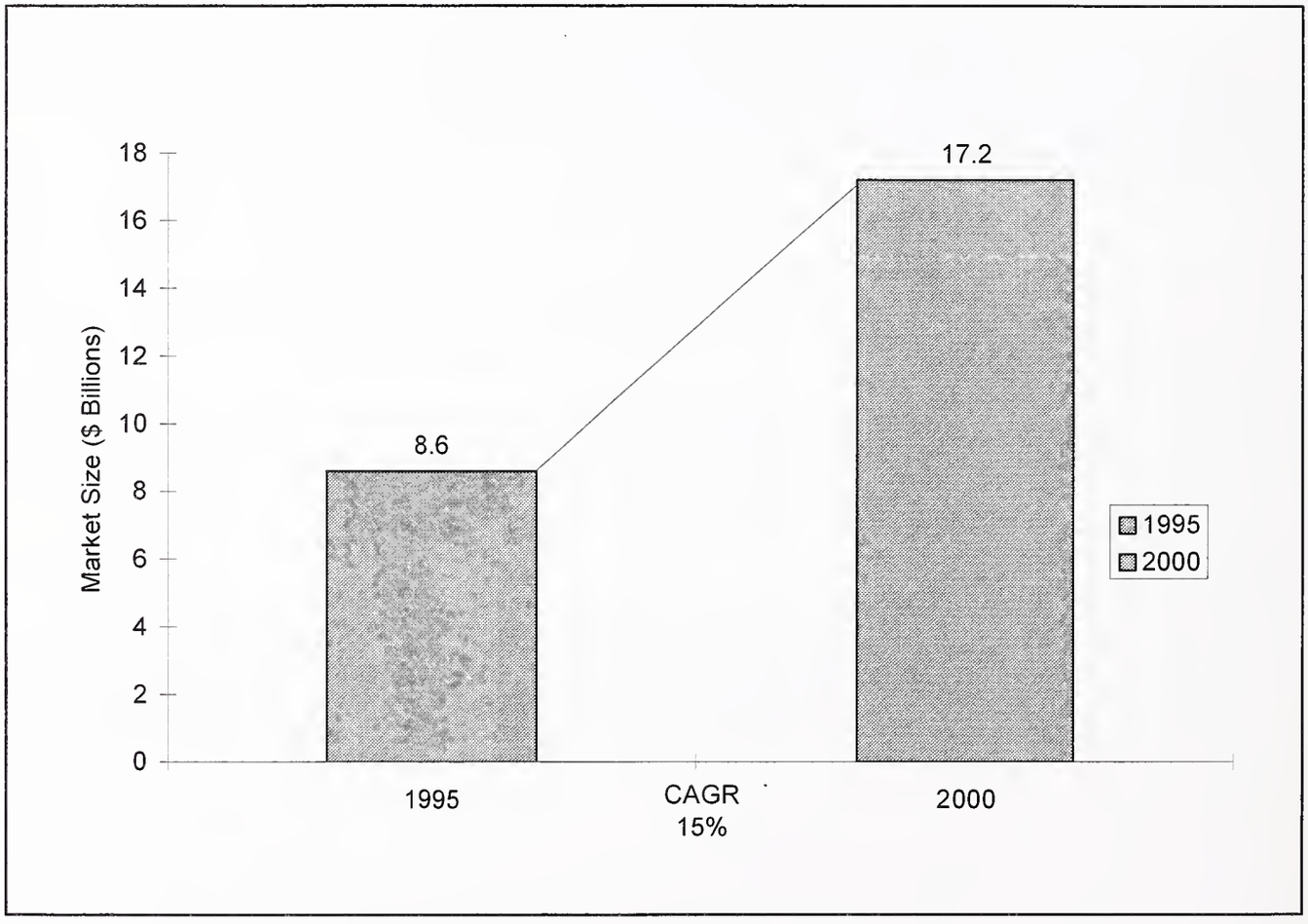
B

Information Services Markets, 1995-2000

As Exhibit II-6 illustrates, the Canadian information services market is forecast to increase at a rate of 15% over the next five years, which is 2% higher than the forecast made in 1994. As discussed in the prior section, the increase is driven to a great extent by the need to upgrade industry capabilities to reduce costs and support a higher volume of business. An important additional factor driving the use of information services is the need to support newer network and client/server technology.

Exhibit II-6

Canadian Information Services Market, 1995-2000



Source: INPUT

By geographic region, the increased information services expenditures will not be spent uniformly. They will tend to follow the distribution shown for 1995 expenditures that is indicated in Exhibit II-7. Almost two-thirds of expenditures will be in Ontario. The percentage of expenditures in the West will increase steadily due to the growth of industry, particularly energy and manufacturing, and population in that region.

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Exhibit II-7

Division of Information Services Expenditures by Geographic Area, 1995

Region	Total Expenditures (Percent)
Ontario	63
Quebec	16
West	20
East	1

Source: INPUT

Federal government expenditures are examined separately in Exhibit II-8. The federal government is still an important market in view of its size.

Exhibit II-8

Forecast IT Market Share in 1995 by Region

Category	Market Share (Percentage)
Ontario	54
Quebec	12
West	17
East	1
Federal Government	16

Source: INPUT

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C
Comparison of Information Services Use

With the inclusion of business operations, outsourcing becomes the fifth most frequently used delivery mode in 1995 as shown in Exhibit II-9.

- Professional services will remain the most widely used delivery mode, but outsourcing accounts for more expenditures in 1995.
- Application software products will remain in high use, driven by the sales of products for client/server and workstation systems.

Exhibit II-9

Respondent Use of Information Services

Delivery Mode	Respondents Acquiring Products/Services in 1995 (Percent)
Professional Services	67
Applications Software	65
Systems Software	62
Network Services	52
Outsourcing	40
Systems Integration	32
Processing	24
Turnkey	18

Source: INPUT

Network services are growing at a fast rate, but the present volume of business is small. These services and particularly Internet-related services will increase in importance and also drive the development of software and other capabilities.

The largest gain in expenditures for an information services use in the planning period are for outsourcing as shown in Exhibit II-10. In specific, platform operations outsourcing offers the greatest opportunity for growth of revenues during the planning period.

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- Professional services ranks second as a delivery mode for the greatest gain in expenditures, almost $1.2 billion, during the planning period. Almost half of that is from expenditures for software development.

- The gain in expenditures for application software products for workstation/PCs including client/server systems between 1995 and 2000 is forecast to be over $700 million, making it one of the fastest growing submodes.

Exhibit II-10

Largest Gains in Information Services Delivery Modes, 1995-2000

Delivery Mode	CAGR 1995-2000 (Percent)
Outsourcing	23
Network Services	16
Applications Software Products	13

Source: INPUT

Significant gains in information services expenditures among industries during the next five years are shown in Exhibit II-11. Manufacturing and banking and finance continue to be the most attractive markets. A comparison of growth rates during the next five years, with market size in 1995, also illustrates that manufacturing and banking and finance dominate the market opportunities.

Exhibit II-11

Significant Gains in Information Services Expenditures

Market Sector	Increase in Annual Expenditures, 1995-2000 ($ Millions)	CAGR, 1995-2000 (Percent)
Discrete and Process Manufacturing	1,968	18
Banking and Finance	1,450	15
Telecommunications and Utilities	703	18

Source: INPUT

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- Several vendors pointed out that telecommunications and utilities were also of interest to them since they combined growth with a lower level of competition than would be found in manufacturing and banking/finance.

- Manufacturing as a whole (process and discrete) as well as the banking/finance and federal government markets are more than three times larger than many other markets as shown in Exhibit II-12.

Exhibit II-12

Share of Information Services Expenditures by Key Market Sectors, 1995

Vertical Market	Share (Percent)
Manufacturing	17
Banking and Finance	16
Federal Government	9
Insurance	5
Business Services	4
Telecommunications	4
Wholesale Trade	3
Utilities	2
All Other	39

Source: INPUT

D
Competitive Analysis

Vendors who have large market shares in the Canadian market tend to offer multiple services and are likely to offer professional services even if their principal delivery modes are other services, as illustrated in Exhibit II-13. Most major vendors feel that it is necessary to have professional services strengths such as IT consulting to aid in planning applications, technical strengths to aid in utilizing new technology and software development capabilities to aid in modifying existing software to meet customer needs. Some vendors report that they may rely on alliances or subcontractors to meet these needs, but they want to present the image of total support.

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Exhibit II-13

Market Rating of Selected Vendors of Information Services in Canadian Market, 1995

Company	Relative Rating*	Key Products/Services
IBM	4.2	Software Products, Professional Services, Systems Integration, Processing, Systems Operations
Andersen Consulting	3.7	Professional Services, Systems Integration
CGI	3.5	Professional Services, Systems Integration, Systems Operations
LGS	3.5	Professional Services, Software Products
EDS	3.2	Systems Operations, Professional Services
Coopers & Lybrand	3.2	Professional Services, Systems Integration
DMR	3.1	Professional Services, Systems Integration
SHL	3.1	Systems Integration, Professional Services
DEC	2.9	Professional Services, Systems Integration
IST	2.3	Processing, Turnkey Systems, Professional Services

**Rating by vendors and users: 5 = High, 1 = Low* *Source: INPUT*

- Exhibit II-14 shows the number of mentions received by vendors in relation to information services assignments. Most vendors serve multiple industries.

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Exhibit II-14

Vendor Recognition by User Respondents

Vendor	Users Who Ranked Work of Vendor (Percent)
IBM	65
DMR	45
Microsoft	40
SHL	38
Andersen Consulting	35
DEC	35
Ernst & Young	35
Coopers and Lybrand	33
LGS	30
Price Waterhouse	30
CGI	25
EDS	18
Cognos	15
Oracle	15
Unisys	10
Computer Associates	5
Computer Task Group	5
Hewlett-Packard	5
Bell Sygma	4
SAS	3

Source: INPUT

- A rating of vendor strength in IT consulting or system planning by user respondents is shown in Exhibit II-15. Vendors who are seeking large contracts tend to be rated highest in this capability. These vendors tend to be larger companies with experience in many industries and technologies. They include Big 6 and IT companies with recognized expertise.

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Exhibit II-15

User Ratings of Vendors by Strategic Consulting Capabilities

Vendor	Rating of Strategic Consulting*
Andersen Consulting	4.0
IBM	3.9
Ernst & Young	3.8
LGS	3.6
EDS	3.5
DMR	3.4
Coopers and Lybrand	3.4
CGI	3.4
SHL	3.3
Bell Sygma	3.3
DEC	3.2

** Rating: 5 = High, 1 = Low* *Source : INPUT*

- A rating of vendor strength in software development is shown in Exhibit II-16. Many of the companies ranked highly in this exhibit were also ranked highly in IT consulting. IT firms, who specialize in professional services such as LGS and CGI, tend to rank higher on a relative basis in this chart.

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Exhibit II-16

User Ratings of Vendors by Software Development Capabilities

Vendor	Rating of Systems Building*
IBM	3.8
Andersen Consulting	3.7
Ernst & Young	3.7
LGS	3.6
DMR	3.6
EDS	3.5
CGI	3.5
Bell Sygma	3.4
SHL	3.2
Coopers and Lybrand	3.1
DEC	3.1

** Rating: 5 = High, 1 = Low* *Source: INPUT*

- Special expertise in certain capabilities such as networking and object-oriented technology is important in gaining business, today, as several vendors emphasized. The rating that user respondents gave to vendors for technical consulting to aid in using these and other technologies are shown in Exhibit II-17.

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Exhibit II-17

User Ratings of Vendors by Technical Consulting Capabilities

Vendor	Rating of Technical Consulting*
IBM	3.7
Andersen Consulting	3.6
Ernst & Young	3.6
LGS	3.5
Bell Sygma	3.5
DMR	3.4
CGI	3.4
SHL	3.4
EDS	3.3
DEC	3.3
Coopers and Lybrand	3.2

** Rating: 5 = High, 1 = Low* *Source: INPUT*

E
Conclusions and Recommendations

1. Conclusions

The favorable manufacturing environment in 1994, driven by NAFTA, turned down in 1995 due to increased U.S. interest rates (See Exhibit II-18) but recovered somewhat in the third quarter. In addition, there were negative factors in the Canadian market.

- Demand from Canadians for goods and services turned weaker in 1995.
- Concern about the tax burden increased during 1994 and 1995. Groups organized to oppose the level of taxes, which have been increasing in membership, are concerned that taxes are having a negative impact on consumer expenditures as well as investment in new businesses.

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IT expenditures, still increasing, have been impacted by last year's intense interest in cost reductions and the quest for increased leverage from technological advances. Users report that they are utilizing services from vendors to upgrade order entry, inventory, customer service and other systems to support higher levels of manufacturing, distribution and utilities business activity. Another strong reason that users reported for seeking aid with new systems is to utilize new technology effectively.

- One of the main concerns of uses is taking advantage of client/server technology. This includes finding or developing application software that will meet needs, as well as deciding what mix of platforms will be used for applications, at a site or throughout the company.

- Users also report that the complexity involved with utilizing ATM, or other communications capabilities or developing systems with object-oriented techniques and new development tools is leading to more use of information services vendors.

Another user concern that is promoting the use of vendors is the desire to ensure that systems are operational and available and that work can be done, a high percentage of the time. Users report that they are placing more emphasis on these needs from vendors.

Exhibit II-18

Key Conclusions and Recommendations

Conclusions • Business, up in 1994, turned down in early 1995 • NAFTA drove expansion in 1994 • Cost reduction is an important current goal • Interest is high in client/server and network technologies • More use of information services is planned
Recommendations • Support demand for client/server and network technologies • Address user interest in systems availability • Consider support of SAP software products

Source: INPUT

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2. Recommendations for Information Services Vendors

Vendors should have plans including a methodology for aiding users to take advantage of client/server and other new technology.

- Skills and experience are needed, but users in all industries are looking for aid in planning what to do as well as doing it.

- In some situations, BPR or systems planning as well as a methodology for implementation will be needed. In others, a methodology for proceeding with application implementation including the selection of platforms will suffice.

In one major contract negotiated in 1995, a large SI vendor convinced a transportation company that it could provide in-depth knowledge of new technology together with knowledge of industry applications. The SI vendor demonstrated this capability on a small contract before winning the major assignment. One of the ingredients in winning the contract was demonstrating the ability to plan and carry out work utilizing new technology.

Vendors must also be prepared to support the selection or development of software for applications. Major SI and professional services vendors have developed the expertise to support SAP software products. Several large vendors have developed expertise in supporting SAP software for particular markets such as utilities or process manufacturing.

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III

Market Analysis

A
Forces Driving Use of Information Services

1. Business Forces

As Exhibit III-1 illustrates, there are three main concerns driving the use of information services vendors: the need to improve or change business systems, cost reductions, and the desire to use new technology effectively.

- The improvements or changes desired are usually industry-specific such as improving manufacturing, the addition of home banking, or risk applications in financial institutions or material management for utilities.

- Consultants may be used to help identify changes or BPR approaches may be used to plan changes in business that, in turn, will drive changes in computing applications.

Exhibit III-1

Forces Driving Use of Information Services

Forces Reported by Respondents	Relative Importance*
Need to Improve Systems to Meet Business Needs	3.9
Need to Reduce Costs	3.8
Desire to Use New Technology Effectively	3.7

**Rating: 5 = High, 1 = Low* *Source: INPUT*

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The need for cost reductions can have a strong effect on the selection of applications for changes, however.

- Cost reduction is a theme that must be kept in mind in the Canadian market. Even when the main objective of projects is to upgrade application systems to meet new requirements, a concern over narrow margins is apt to encourage users to seek aid from vendors who stress their ability to achieve cost reduction.

- Users also report interest in vendors who can upgrade technology in conjunction with projects to upgrade application systems.

The interest is so high in implementing or expanding the use of client/server and communication technology that these steps could be reported as forces driving the use of vendors. Several information services vendors felt that their experience in the use of client/servers was the chief reason for their selection on some projects.

The burst of trade with the U.S. which occurred as a result of NAFTA is the force that had most effect on the Canadian market. The need to upgrade systems to meet new business conditions was stimulated to a large extent by NAFTA. Trade with the U.S. in 1994 led to system improvements in order entry, inventory, and manufacturing systems. Cutbacks in trade in 1995 have stimulated interest in financial controls and accounting systems.

2. Trends in the Use of Information Technology

As noted in the prior section, the use of client/server technology is an important trend in the Canadian market.

- During the summer of 1995, one of the major SI vendors took over a large Canadian IT contract based chiefly on its knowledge of client/server implementation.

- Use of the R3 software product of SAP's client/server solution has also continued to grow in interest in the Canadian market. Support in implementing the R3 system is supplied from Big 6 firms such as Price Waterhouse as well as other IT vendors including Xenos, which supplies software for expanding report capabilities of the R3 system.

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Interest in network solutions including the use of Internet and reengineering are also important trends in the Canadian market as shown in Exhibit III-2.

- Use of private network services and the Internet is growing at an annual rate of over 25%, and a number of businesses are planning to make use of this growth.

- Less formal, as well as structured approaches to business process reengineering, are being discussed with prospects for system changes in the Canadian and other markets at the present time. Some prospects are still concentrating on downsizing, but the trend is toward the consideration of reengineering rather than just downsizing alone.

Exhibit III-2

Key IT-Related Trends in the Canadian Market

Trends Reported	Relative Interest*
Network Applications, Including Use of Internet	4.1
Client/Server Technology	4.0
Reengineering and BPR	3.7
Electronic Commerce	3.4
Downsizing	3.3
Imaging	2.7

**Rating: 5 = High, 1 = Low* *Source: INPUT*

IT trends in the use of electronic commerce and imaging were also noted by respondents. Electronic commerce and EDI were frequently mentioned by some vendors who were advocates of Internet use. Increasingly, use of EDI was mentioned, mostly by users in manufacturing and distribution.

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B
Analyzing Use of Information Services Vendors

1. Factors Involved in Using Information Services Vendors

Knowledge of technology and applications are important for information services, as shown in Exhibit III-3.

- The need to introduce client/server technology has caused technical knowledge to increase in importance as a reason for utilizing vendors.
- Technical knowledge is needed to deal with client/server, graphical interfaces, and object-oriented techniques.

Exhibit III-3

Reasons for Using Information Services Vendors

Reasons	Average Importance*
Technical Knowledge	4.0
Applications Knowledge	3.8
Cost Savings	3.7
Less Risk	3.7
More Rapid Implementation	3.6
Lower In-house Staffing Requirements	3.1

**Rating: 5 = High, 1 = Low* *Source: INPUT*

Vendors' knowledge of business processes is also recognized as highly important in order to efficiently restructure processes to take advantage of technology. This is one reason why vendors have developed knowledge of industries.

Cost savings is still ranked as important as is the rapid implementation of business goals.

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Factors that can inhibit the use of vendors are indicated in Exhibit III-4.

- Although economic, financial, or corporate problems can inhibit the use of information services, a number of users report that they try harder today to overcome obstacles.
- A lack of knowledge of industry, the applications of users, or technical skills can inhibit the use of vendors' services.
- Costs of information services are often an inhibiting factor, but this is not as important as some considerations. Users will seek lower cost services, if necessary.

Exhibit III-4

Factors Inhibiting Use of Vendors

Factor	Relative Importance*
Financial Plans or Budgets	4.0
Changing Business Conditions	3.7
Shortage of Technical Skills by Vendor	3.4
Lack of Vendor Knowledge	3.3
Cost of Information Services	3.2

**Rating: 5 = High, 1 = Low* *Source: INPUT*

2. Considerations in Vendor Selection

Price is reported to still be an important factor in vendor selection as illustrated in Exhibit III-5.

- The net price is only outranked by reputation or references about work done elsewhere as key factors in vendor selection.
- Decisions are reported to be made in favor of vendors who have a comprehensive solution to business problems, even though the selected vendor might not be the lowest one.

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Exhibit III-5

Key Considerations in Vendor Selection

Consideration	Relative Importance*
Reputation/Previous Work Providing Solutions	4.4
Pricing	4.3
Client/Server Capabilities	4.3
Network-Related Experience	4.1
Knowledge of Industry/Application	3.8
Size of Vendor	3.1

**Rating: 5 = High, 1 = Low* *Source: INPUT*

Client/server capabilities and industry knowledge are necessary conditions for attracting clients in addition to pricing and reputation for successfully performing work. Size is generally less important today unless a vendor is very small.

Users report that some vendors of information services do not fully consider problems that occur and this alienates them from these vendors.

Problems reported by users are listed in Exhibit III-6.

- Delays in delivery is still reported as a leading problem. Users can ask past customers about their experiences with a vendor.
- Problems in support also ranked high. The use of technology, particularly client/servers and network capabilities, has placed a high value on support.

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Exhibit III-6

Problems Encountered in Using Vendors

Problems Reported	Percentage of Users Reporting this Problem
Delays or Late Deliveries	10
Poor Communications	7
Limited Support	7
Billing Issues	4
Lack of Application Knowledge Details	4
Lack of Promised Technical Knowledge	3

Source: INPUT

C
Forecasts of Expenditures for Information Services

1. Market Assumptions

The assumptions that have been used in developing forecasts of information services use in the Canadian market are that the GDP deflator will be below 4.5% in 1994 through 1998. This assumption is based on figures of the Conference Board reported in the Financial Times.

2. Forecast of Delivery Modes

Exhibit III-7 indicates user expenditures in each delivery sector tracked by INPUT. Outsourcing will shoot ahead of professional services and applications software products in total volume, driven by growth in platform operations and business process outsourcing.

The slowest growing delivery mode is turnkey systems. Development that would have involved turnkey systems in the past tends to utilize system integration services of vendors. Software products have also been detached from the sale of hardware since multiple choices of open systems hardware can be used.

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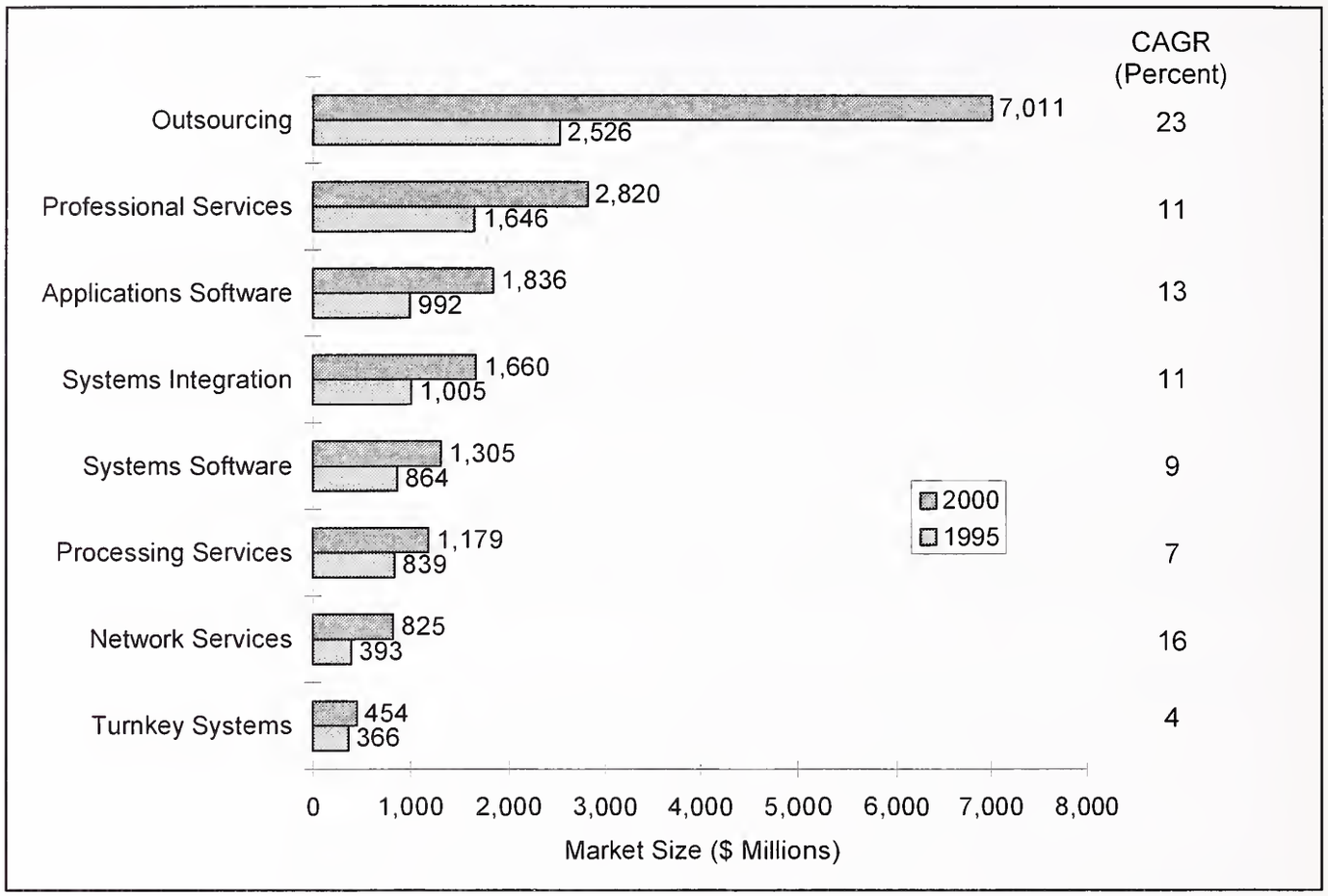
Exhibit III-7

Information Services Expenditures by Delivery Mode, 1995-2000



Source: INPUT

The growth in the use of applications software products is still being fueled by use of workstation and client/server software products. These are growing twice as fast as products for other platforms. Custom development and SI project work for workstation and client/server platforms is also growing faster than work for other platforms.

Exhibit III-8 compares expenditures by industry sector. Manufacturing has the largest dollar volume. Manufacturing and telecommunications have faster growth rates than other sectors being analyzed on an individual basis.

- Some industries with moderate growth in expenditures such as local government are shown in this exhibit and included in the "Other" category.

- Increases in industry growth rates were relatively high in manufacturing, utilities, insurance, business services, and wholesale distribution.

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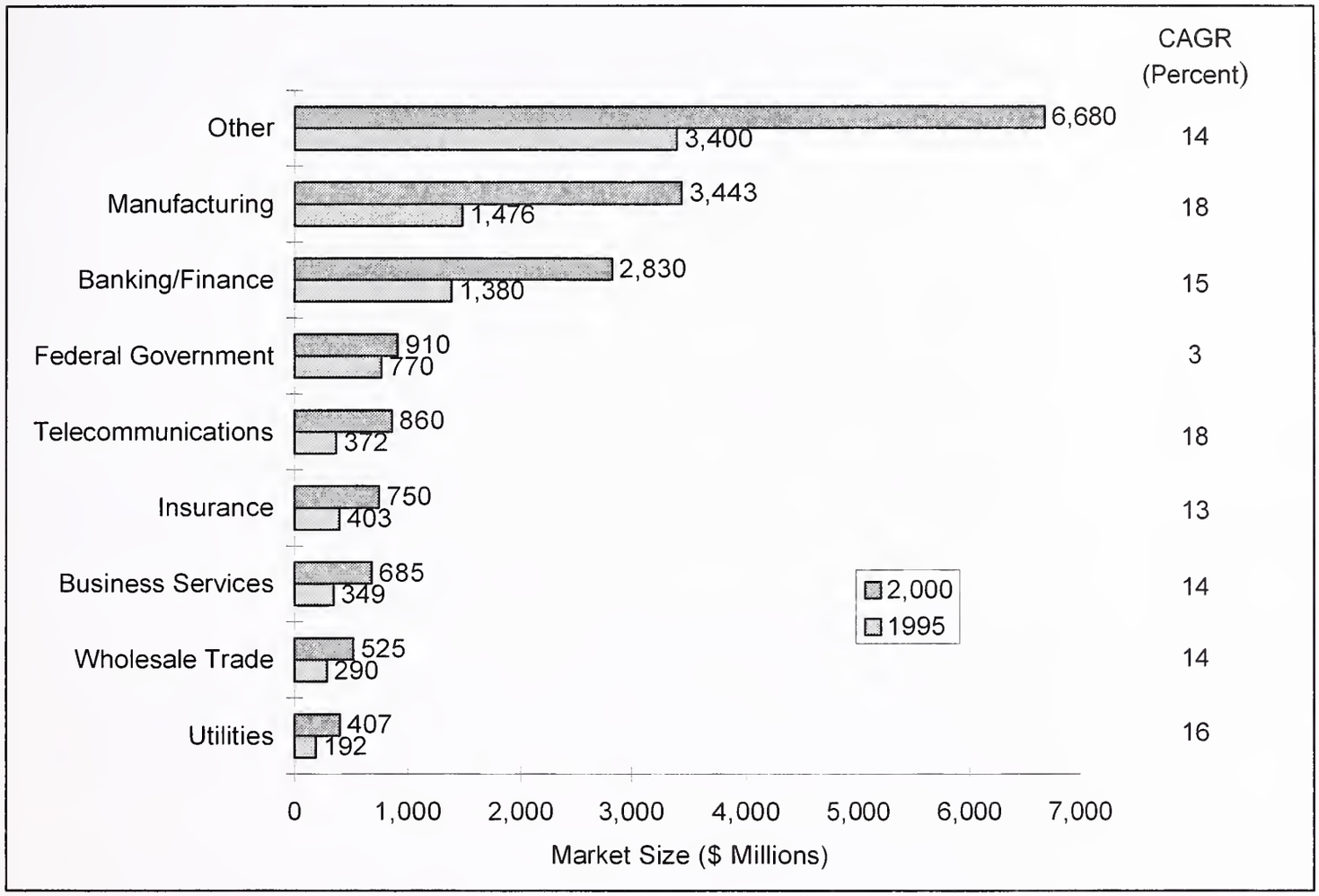
Exhibit III-8

Information Services Expenditures by Industry Group



Source: INPUT

Exhibit III-9 provides a comparison of the growth of information services delivery sectors in Canada (1995-2000) versus the U.S.

- Outsourcing in Canada is now growing at a rate much ahead of the rate in the U.S. due to the need for support in desktop and network management as well as due to the growth in business process outsourcing.

- Growth of turnkey systems and systems integration is below rates for the U.S. Some prospects for these services report use of professional services development as an alternative.

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Exhibit III-9

Information Services Growth in Canada versus the U.S.

Delivery Mode	CAGR in Canada, 1995-2000 (Percent)	CAGR in U.S., 1995-2000 (Percent)
Outsourcing	23	18
Network Services	16	17
Application Software Products	13	17
Systems Integration	11	16
Professional Services	11	13
Systems Software Products	9	9
Processing	7	7
Turnkey Systems	4	9

Source: INPUT

3. Forecast by Market Sector

Exhibit III-10 compares growth rates in market sectors in Canada and the U.S. Except for the federal government, banking, and telecommunications, growth rates in selected industries in the two countries are different by 2% or less.

- As a whole, the growth rate for information services in the U.S. is about one percent below the growth rate in Canada despite differences in individual industry sectors.

- For the market sectors with the highest information services expenditures in Canada, manufacturing and finance, the growth rates are higher than those in the U.S.

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Exhibit III-10

Information Services Growth In Selected Industries in Canada versus the U.S.

Industry	CAGR in Canada, 1995-2000 (Percent)	CAGR in U.S., 1995-2000 (Percent)
Manufacturing (Discrete and Process)	18	16
Telecommunications	18	21
Utilities	16	14
Banking and Finance	15	12
Wholesale Trade	14	14
Business Services	14	13
Insurance	13	13
Other	11	12
Federal Government	3	7
Total	15	14

Source: INPUT

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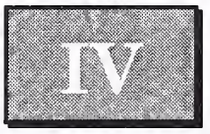

Vendor Use In Market Sectors

This chapter reviews, for each major vertical market, the factors affecting the market, the growth of information services in the sector and vendors active in the sector.

A
Manufacturing Market

1. Factors Affecting the Manufacturing Market

Although cost reduction remains important, manufacturing users report that other factors (see Exhibit IV-1) are important in their business environment.

- Downsizing, process reengineering efforts, and a host of application changes have made Canadian businesses more concerned with and responsive to business changes.

- The need to use clients/servers is ranked very high, but users are concerned about the challenges of developing and customizing applications for this technology.

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Exhibit IV-1

Factors Affecting Manufacturing

Factor	Relative Importance to Users*
Becoming more Responsive to Business Changes	4.0
Use of Client/server Technology	3.9
Need for Cost Reduction	3.8
Need for Greater Productivity	3.5
Impact of Taxes	3.3
Meeting Competition	3.3

**5 = High, 1 = Low* *Source: INPUT*

Technological needs differ between discrete and process manufacturing (see Exhibits IV-2 and IV-3), but similar factors are emphasized in both.

- Downsizing and reengineering are of interest in both submarkets of manufacturing since they can lead to cost reduction.
- Manufacturing submarkets also report increased interest in EDI since it can save costs and facilitate business activity.
- Interest in open systems remains high, but respondents expect to find open systems available for this.

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Exhibit IV-2

Technological Directions in Discrete Manufacturing

Factor	Relative Importance to Users*
Use of Client/Server Technology	4.0
Reengineering	3.8
Downsizing	3.7
Network Technology	3.6
EDI	3.5
Open Systems	3.2
Imaging	2.3

**5 = High, 1 = Low* *Source: INPUT*

Exhibit IV-3

Technological Directions in Process Manufacturing

Factor	Relative Importance to Users*
Use of Client/Server Technology	4.0
Reengineering	3.9
Downsizing	3.6
Network Technology	3.6
EDI	3.4
Open Systems	3.1
Imaging	2.2

**5 = High, 1 = Low* *Source: INPUT*

2. Growth of Information Services in Manufacturing, 1995-2000

Exhibit IV-4 shows that outsourcing and network services will have the highest growth rates in information services in manufacturing between 1995 and 2000.

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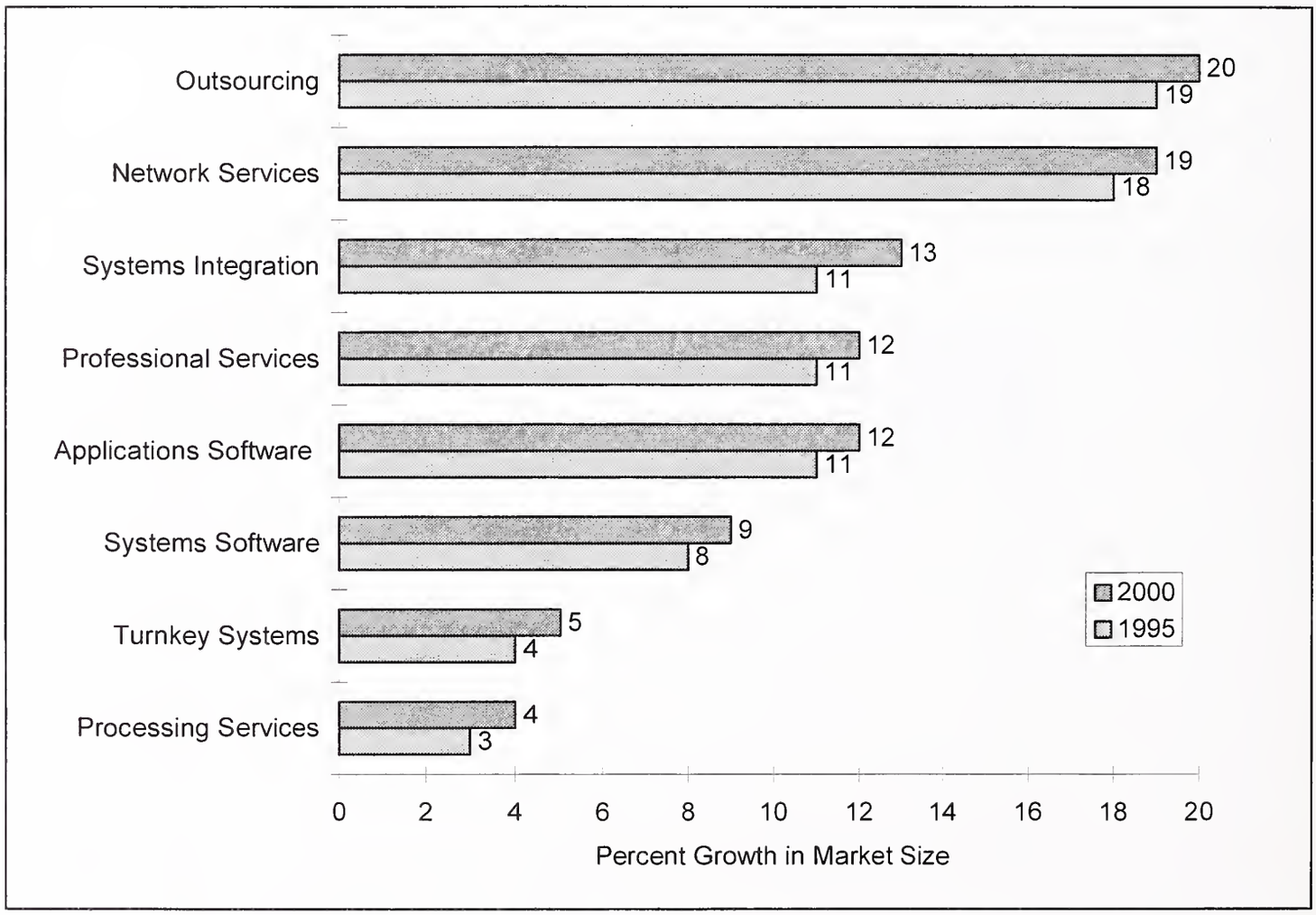
- Most service sectors report higher growth for the period from 1995 to 2000 than in 1995 alone, indicating that users feel that the need to use these services will increase over the next five years.

- The desire to outsource aid for desktop service and network management as well as to outsource the operation of applications and/or computing sites is driving growth of outsourcing. This growth does not reflect the outsourcing of administrative processes.

Exhibit IV-4

Growth Forecast by Manufacturing Users



Source: INPUT

A wide range of applications in relation to the use of information services is mentioned by manufacturing users.

- Accounting and financial applications and manufacturing operations were mentioned most frequently.

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- Inventory, purchasing, sales, and materials management were also of interest.

3. Rating Vendors Serving Manufacturing

Exhibits IV-5a and IV-5b indicate there are differences in the ratings of vendors of information services by discrete and process manufacturing users.

- Vendors tend to be rated at almost identical levels in process and discrete manufacturing.
- However, DMR and Andersen Consulting have noticeable differences.

Discrete users report a greater interest in planning and issues regarding data management where Andersen has been rated higher. Process users report more interest in technical assistance to generate solutions.

Exhibit IV-5a

Vendors of Information Services to Discrete Manufacturing Users

Vendor	Relative Rating of Work by Users*
Andersen Consulting	4.0
E & Y	3.9
IBM	3.8
DMR	3.7
SHL	3.6
LGS	3.1
Digital	3.0

**5 = High, 1 = Low* *Source: INPUT*

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Exhibit IV-5b

Vendors of Information Services to Process Manufacturing Users

Vendor	Relative Rating of Work by Users*
E & Y	3.8
IBM	3.7
Andersen Consulting	3.6
DMR	3.4
SHL	3.4
LGS	3.3
Digital	3.1

**5 = High, 1 = Low* *Source: INPUT*

B
Finance/Banking Market

1. Factors Affecting the Finance/Banking Market

Finance and banking market users report factors in their business environment are important in relation to the use of information services as illustrated in Exhibit IV-6.

- The current need to deal with lending problems and better evaluate lending opportunities is leading to greater use of information services.
- There is a need to reduce costs in front and back office functions that is encouraging greater use of information services.

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Exhibit IV-6

Factors Affecting Finance and Banking

Factor	Relative Importance to Users*
Risk	4.1
Lending	3.8
Use of Electronic Banking	3.7
Need for Client/Server Technology	3.6
Need to Reengineer Business Systems	3.6
Need to Improve Productivity	3.5
Tax Burden	3.2

**5 = High, 1 = Low* *Source: INPUT*

Users report client/server technology is of growing interest to users as a means of monitoring commercial loans and controlling costs in functional areas.

- Growing use of client/server technology is leading finance and banking institutions to use IT more effectively.

- A desire to change IT use is reflected in the technological directions of interest in finance/banking shown in Exhibit IV-7, which emphasizes downsizing, reengineering and client/server use. (Users also mentioned need for improved data management software to handle these directions.)

An interest in using imaging and EDI as well as client/server technology has also risen sharply in the last year as shown in Exhibit IV-7.

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Exhibit IV-7

Technological Directions in Discrete Manufacturing

Factor	Relative Importance to Users*
Use of Client/Server Technology	3.9
Electronic Banking	3.7
Downsizing	3.6
Network Technology	3.6
Reengineering	3.5
EDI	3.4
Imaging	3.3

**5 = High, 1 = Low* *Source: INPUT*

2. Growth of Information Services in Finance/Banking, 1993-1998

Plans for the use of IT to meet business objectives are reflected in the user forecasts for the use of information services shown in Exhibit IV-8. These ideas together with data from vendors were used to develop the forecasts shown in Appendix B.

- Planned expenditures for application software products, professional services, outsourcing and network services will grow at rates above those for the market as a whole over the next five years.
- The growth in expenditures is particularly high for application software products for workstation and client/server platforms.
- User forecasts for the five-year period by users are notably above the rates forecast for 1994 for outsourcing and network services where users anticipate significant future growth due to expanding use of desktop and network support and process outsourcing as well as use of EDI and E-mail.

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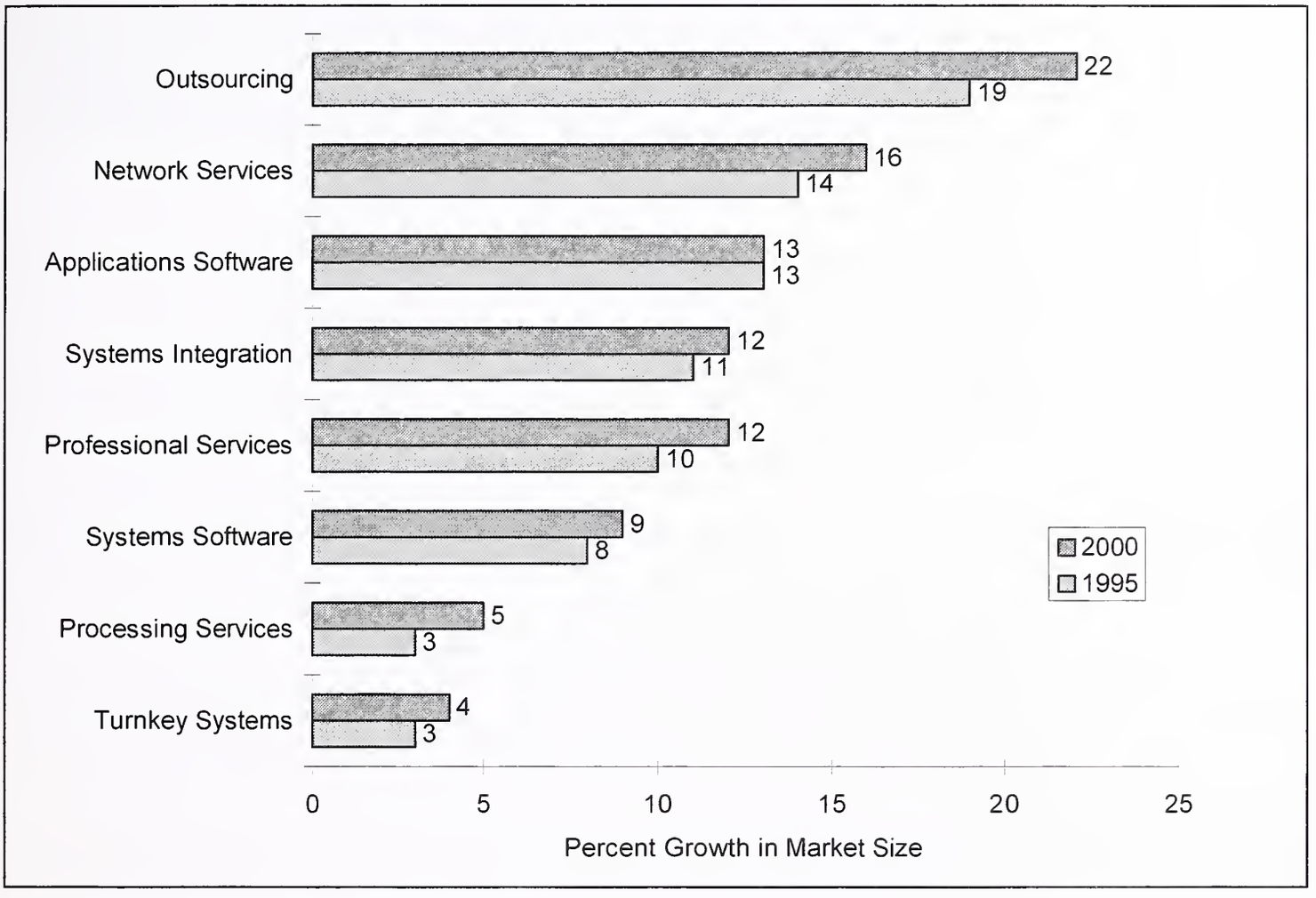
Exhibit IV-8

Growth Forecast by Finance/Banking



Source: INPUT

3. Rating Vendors Serving Finance/Banking

Exhibit IV-9 shows vendors of information services ranked highest for their work by finance/banking users are also vendors who serve the manufacturing market.

- A limited set of large vendors exist in Canada and they tend to address multiple market sectors.
- The largest vendors in terms of current sales in banking/finance and manufacturing include vendors of computer hardware and auditing as well as firms dedicated to information services.

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Exhibit IV-9

Vendors of Information Services to Finance and Banking

Vendor	Relative Rating of Work by Users*
E & Y	3.9
IBM	3.8
DMR	3.6
SHL	3.3
Digital	3.0

**5 = High, 1 = Low* *Source: INPUT*

C
Insurance Market

1. Factors Affecting the Insurance Market

Information services users in the insurance market feel pressures to cut costs and move work to client/servers are important in their business environment, as shown in Exhibit IV-10.

- The pressure to cut costs are leading to changes and restructuring of automated systems.
- Moving work to client/server server systems is taking place to improve business functions as well as to reduce costs.

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Exhibit IV-10

Factors Affecting Insurance

Factor	Relative Importance to Users*
Pressure to Cut Costs	3.8
Need to Use Client/Server	3.7
Need to Reengineer Business Systems	3.7
Need to Improve Productivity	3.5
Tax Burden	3.2
Respond to Competition	3.0

**5 = High, 1 = Low* *Source: INPUT*

As illustrated in Exhibit IV-11, the use of client/servers and downsizing also leads the technological directions of interest in the insurance market.

- Reengineering ranks high as a technological direction both in reengineering of automated systems and the use of BPR in company processes.

- Other technologies, including network technology, EDI and the use of imaging are also of interest. Although users still report its use, CASE has been down-valued as a development technique.

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Exhibit IV-11

Technological Directions in Insurance

Factor	Relative Importance to Users *
Use of Client/Server Technology	3.8
Reengineering	3.8
Network Technology	3.6
Open Systems	3.1
Downsizing	3.1
EDI	3.1
Imaging	2.4

**5 = High, 1 = Low* *Source: INPUT*

2. Growth of Information Services in Insurance, 1995-2000

Growth of information services expenditures is anticipated by users for the insurance market, as indicated in Exhibit IV-12. Network services and outsourcing are forecast to enjoy the highest growth rates between 1995 and 2000.

- A higher rate of growth for most of these service modes is expected for the period from 1995 to 2000 than in 1995 by itself suggesting that users feel the need to use these services will increase over the five-year period.

- Outsourcing shows the greatest difference between the near-term growth rate and the rate for the next five years because users anticipate more use of vendor aid to run work and supply help as work is downsized. (Users report that the use of vendors has increased sharply.)

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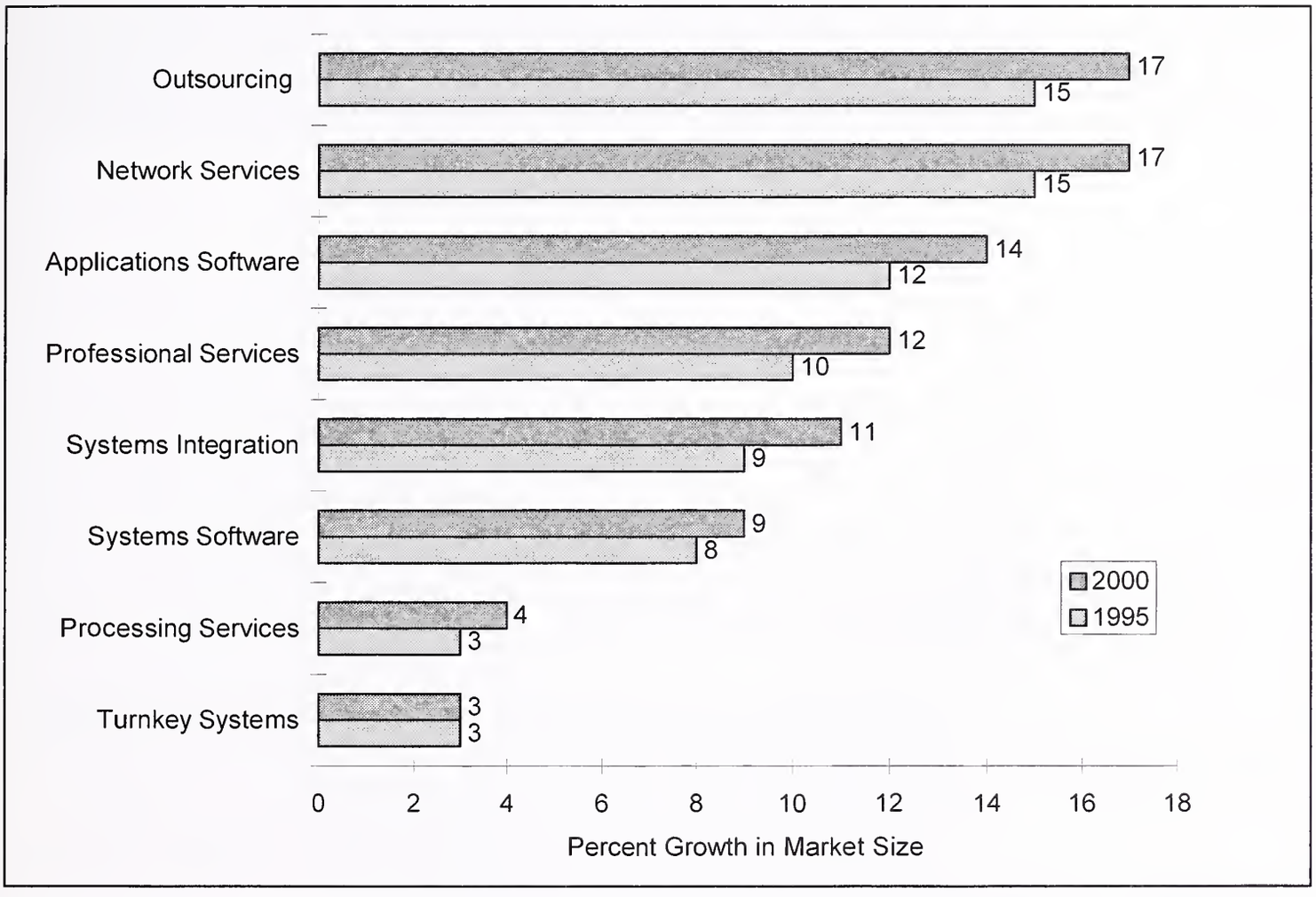
Exhibit IV-12

Growth Forecast by Insurance Users



Source: INPUT

The use of SI is slightly above its average use in other vertical sectors, but the use of turnkey systems is less. More modification of software products is needed than would be provided in turnkey situations. This tends to favor the use of professional services or system integration

3. Rating Vendors Serving Insurance

LGS leads vendors of information services ranked high by insurance users, as shown in Exhibit IV-13. Most of the vendors rated by users are bunched quite closely together in the ratings, indicating the potential for competition for information services work.

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Exhibit IV-13

Vendors of Information Services to Insurance

Vendor	Relative Rating of Work by Users*
LGS	3.6
Andersen Consulting	3.4
IBM	3.4
E & Y	3.3
DMR	3.3
SHL	3.2
EDS	3.1
C & L	3.0
Digital	2.8

**5 = High, 1 = Low* *Source: INPUT*

- Other vendors were mentioned by a few users, but were not included in Exhibit IV-13 because they were not rated by six or more users.
- The market share of vendors can make a difference in obtaining additional business. Several users mentioned using IBM and DMR because they are leaders in market share.

D
Wholesale Trade Market

1. Factors Affecting the Wholesale Trade Market

Users in the wholesale market report the factors shown in Exhibit IV-14 are important in their business environment.

- A strong desire to expand client/server use is apparent in wholesale and is stimulating demand for software and services.
- The factors that are reported emphasize a positive business outlook as well as pressure to cut costs and improve productivity and service. These factors are promoting the use of information services.

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Exhibit IV-14

Factors Affecting Wholesale

Factor	Relative Importance to Users*
Increased Trade with U.S.	4.0
Pressure to Reduce Costs	3.9
Need for Service Improvement	3.7
Need to Expand Client/Server Use	3.6
Need for Increased Productivity	3.4
Tax Burden	3.1

**5 = High, 1 = Low* *Source: INPUT*

Recent developments in the U.S. market in which giant retailers such as Wal-Mart and Home Depot are bypassing independent wholesalers and dealing directly with manufacturers are not as significant in the Canadian market.

Users report the desire to utilize EDI to reduce costs and facilitate business is growing in Canada as well as the U.S. and is mentioned as a technological trend in Exhibit IV-15.

- Leading trends in relation to technological directions in wholesale trade are use of client/server and network technology according to respondents.

- Use of open systems and downsizing are also noted as important technological trends.

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Exhibit IV-15

Technological Directions in Wholesale

Factor	Relative Importance to Users *
Use of Client/Server Technology	4.0
Network Technology	3.8
Reengineering	3.7
EDI	3.6
Downsizing	3.4
Open Systems	3.2
Imaging	2.3

**5 = High, 1 = Low* *Source: INPUT*

2. Growth of Information Services in Wholesale Trade, 1995-2000

Expenditures for outsourcing and software products are expected to grow at rates above average over the next five years in wholesale, as illustrated in Exhibit IV-16.

- Applications mentioned most often in relation to this growth were inventory and financial in nature.
- Expenditures planned for software products also indicate growth of downsizing and use of client/server technology.

Some wholesale users mentioned high growth of network services to support EDI and electronic commerce.

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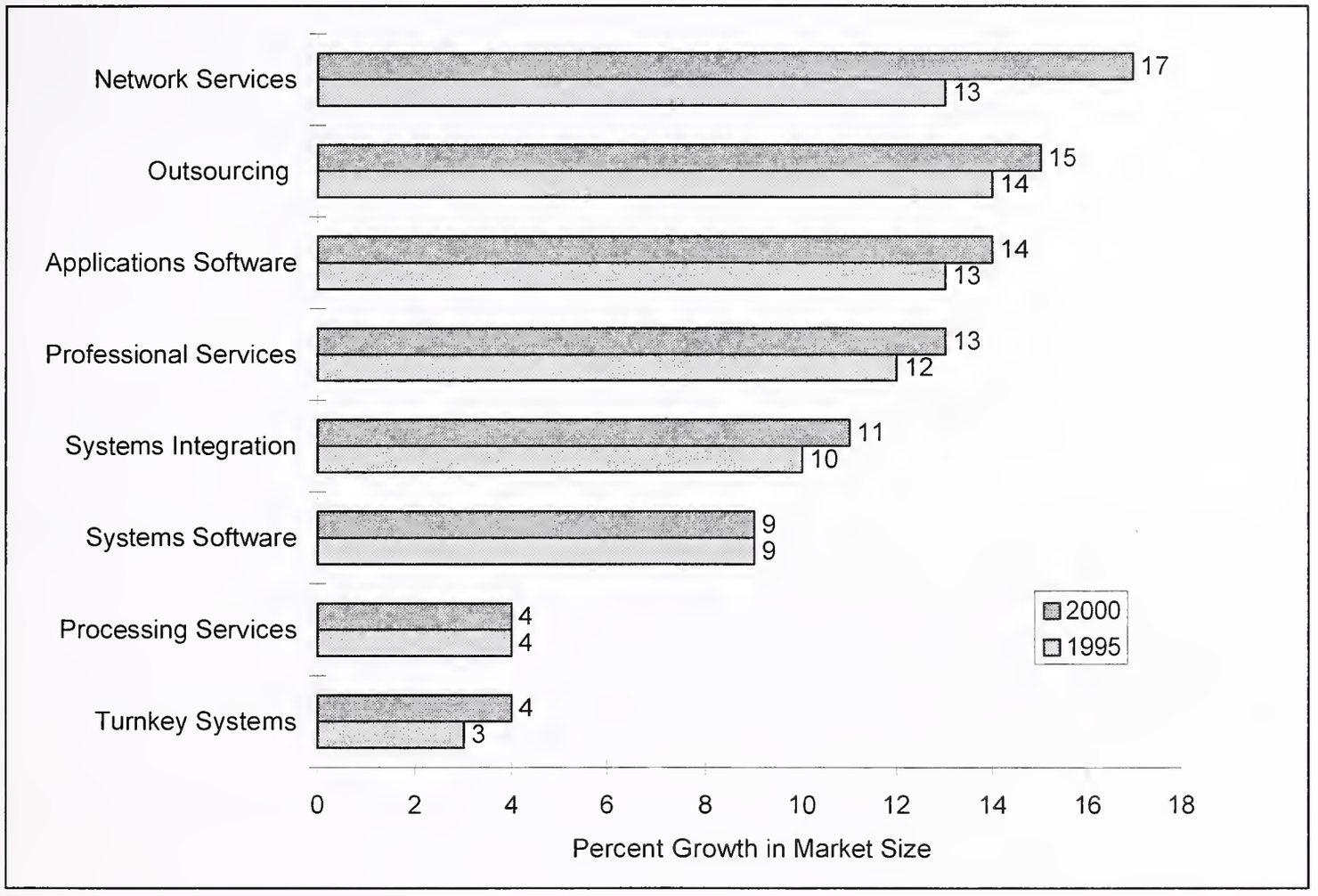
Exhibit IV-16

Growth Forecast by Wholesale Trade



Source: INPUT

The growth for outsourcing, shown in Exhibit IV-16, illustrates that use of outsourcing is growing rapidly in the wholesale market, although it is growing from a small base.

3. Rating Vendors Serving Wholesale Trade

A group of vendors is rated at about the same level for their work in wholesale trade as shown in Exhibit IV-17.

- IBM and SHL are ranked as highest but followed closely by DMR and Ernst & Young in terms of their evaluation as prospective suppliers.
- CGI and Coopers & Lybrand were also ranked highly, but by a small number of users.

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Exhibit IV-17

Vendors of Information Services to Wholesale Trade

Vendor	Relative Rating of Work by Users*
SHL	3.8
IBM	3.7
DMR	3.6
E & Y	3.5
Digital	3.2

**5 = High, 1 = Low* *Source: INPUT*

E
Retail Trade Market

1. Factors Affecting the Retail Trade Market

Users in the retail market report a group of factors as important in their business environment, which is illustrated in Exhibit IV-18.

- Users feel that conditions of business are not as good in some areas of Canada or with some goods or services.
- Retailers also feel the need to improve service ranks high although more weight is given to the use of new technology to reduce costs.

Exhibit IV-18

Factors Affecting Retail

Factor	Relative Importance to Users*
Uneven Business Conditions	4.0
Pressure to Reduce Costs	3.8
Need to Upgrade Business Systems and Networks	3.7
Need for Service Improvement	3.6
Need to Expand Client/Server Use	3.5

**5 = High, 1 = Low* *Source: INPUT*

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Retail users state that market factors tend to favor greater use of information services.

- The need to improve services to customers and upgrade business systems and networks, while cutting costs are recognized as reasons to increase expenditures for IT and information services.
- A need to upgrade business systems is also expanding use of information services.

As shown in Exhibit IV-19, there is a close grouping of technology trends by retail users.

- Client/server and network technology lead trends in retail, but reengineering, EDI and open systems rank close behind.

Exhibit IV-19

Technological Directions in Retail

Factor	Relative Importance to Users *
Use of Client/Server Technology	3.6
Network Technology	3.4
EDI	3.2
Reengineering	3.0
Open Systems	3.0
Downsizing	2.9
Imaging	2.2

**5 = High, 1 = Low* *Source: INPUT*

- A trend in expanded data distribution is also important. It is reflected in trends for downsizing and greater use of client/server technology.

2. Growth of Information Services in Retail Trade, 1995-2000

The growth in use of information services forecast by retail users shown in Exhibit IV-20 indicate several notable changes will take place between 1995 and 2000.

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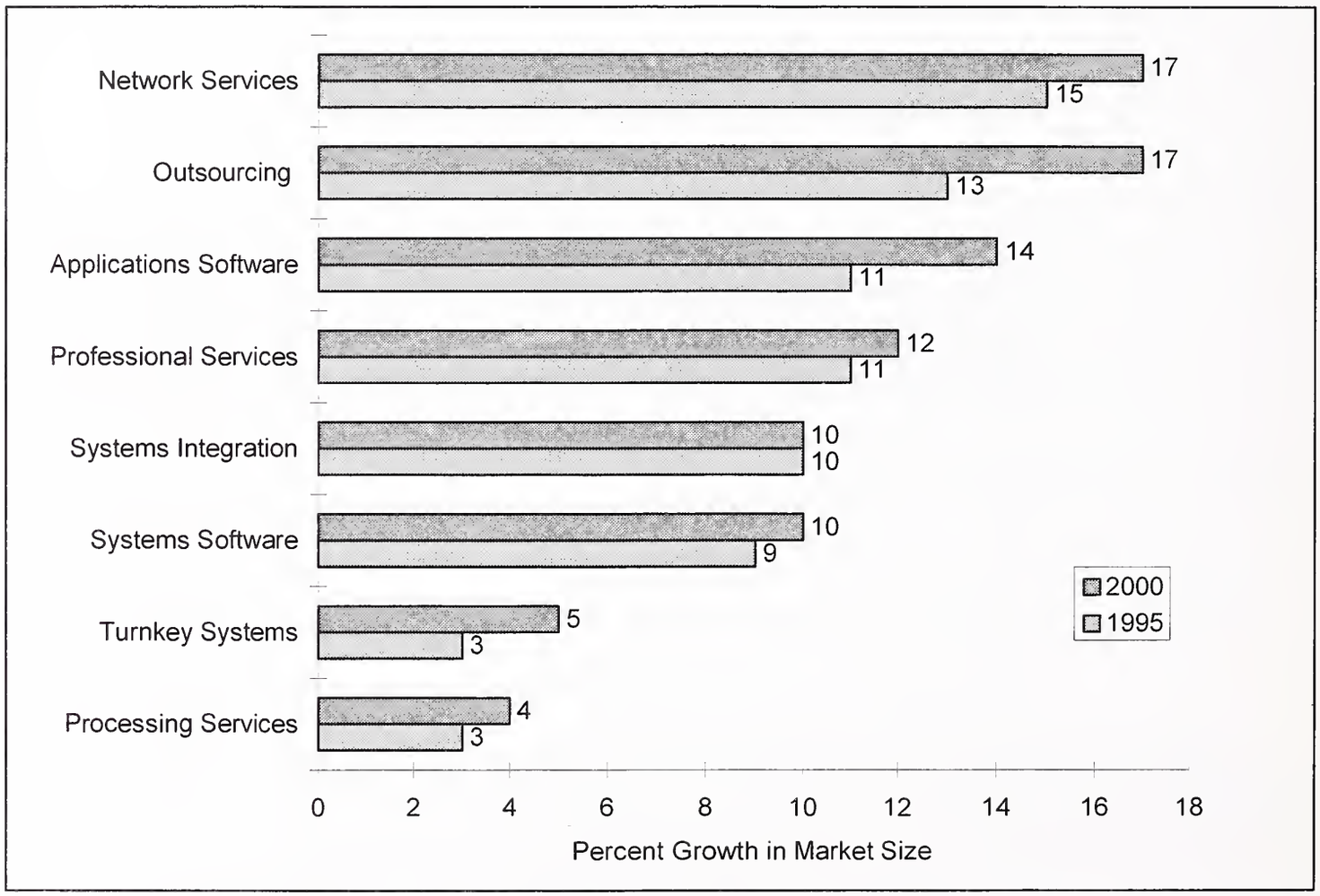
- A use of outsourcing will grow rapidly to meet needs for aid with new client/server and network technology. Outsourcing of business processes will also increase at a high rate in this industry.

- Professional services are growing rapidly to meet cost savings improve accounting and financial reporting, but this use will fall off as the use of SI and new application software products increase to meet these objectives.

Exhibit IV-20

Growth Forecast by Retail Trade



Source: INPUT

3. Rating Vendors Serving Retail Distribution

As shown in Exhibit IV-21, users ranked Coopers & Lybrand, IBM, and CGI highest among the vendors serving the retail industry.

Retail users reported they were interested in vendors who had experience in retail application systems, including accounts payable,

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general ledger, inventory and merchandising. Knowledge of these applications and of EDI are important in retail distribution.

Exhibit IV-21

Vendors of Information Services to Retail

Vendor	Relative Rating of Work by Users*
C & L	3.8
IBM	3.8
CGI	3.7
Andersen Consulting	3.5
Digital	3.2

**5 = High, 1 = Low* *Source: INPUT*

F
Utilities and Telecommunication Markets

1. Factors Affecting Utilities and Telecommunication Markets

Factors reported by users of information services in the utilities and telecommunication market are ranked in importance in Exhibit IV-22.

- Factors mentioned by users emphasize cost reduction and service improvement.
- Utilities and telecommunications users also feel there is a need to implement new IT developments to meet cost reduction and service goals. New technology of interest included client/servers, TCP/IP, ATM and other network technology as well as storage products including RAID.

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Exhibit IV-22

Factors Affecting Utilities and Telecommunications

Factor	Relative Importance to Users*
Pressure to Increase Productivity/Cut Costs	4.2
Need to Implement IT/Network Systems	3.9
Need for Service Improvement	3.9
Need to Upgrade or Reengineer Business Systems	3.7
Regulatory Changes and Reporting	3.0

**5 = High, 1 = Low* *Source: INPUT*

Use of client/server and network technology and reengineering are given highest importance as technological trends, as shown in Exhibit IV-23.

- Users reported that client/server technology would be used to convert mainframe applications such as inventory, purchasing, materials management and operations systems.

- Use of new network and storage capabilities were mentioned as trends of importance. Both the utilities and telecommunication industries are seeking aid from vendors to investigate and use new technology.

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Exhibit IV-23

Technological Directions in Utilities and Telecommunications

Factor	Relative Importance to Users*
Use of Client/Server Technology	3.9
Network Technology	3.8
Reengineering	3.6
Downsizing	3.5
New Storage Devices, Including RAID	3.5
Open Systems	3.4
EDI	3.0
Imaging	2.4

**5 = High, 1 = Low* *Source: INPUT*

2. Growth of Information Services in Telecommunication/ Utilities, 1995-2000

Growth rates planned for the use of information services are shown in Exhibit IV-24. Outsourcing will be increasingly valued as a delivery sector.

- Exhibit IV-24 shows that growth of outsourcing, professional services, and network services will increase.
- Use of other modes will continue to grow at meaningful rates except for use of turnkey systems which will be less important in future IT work.

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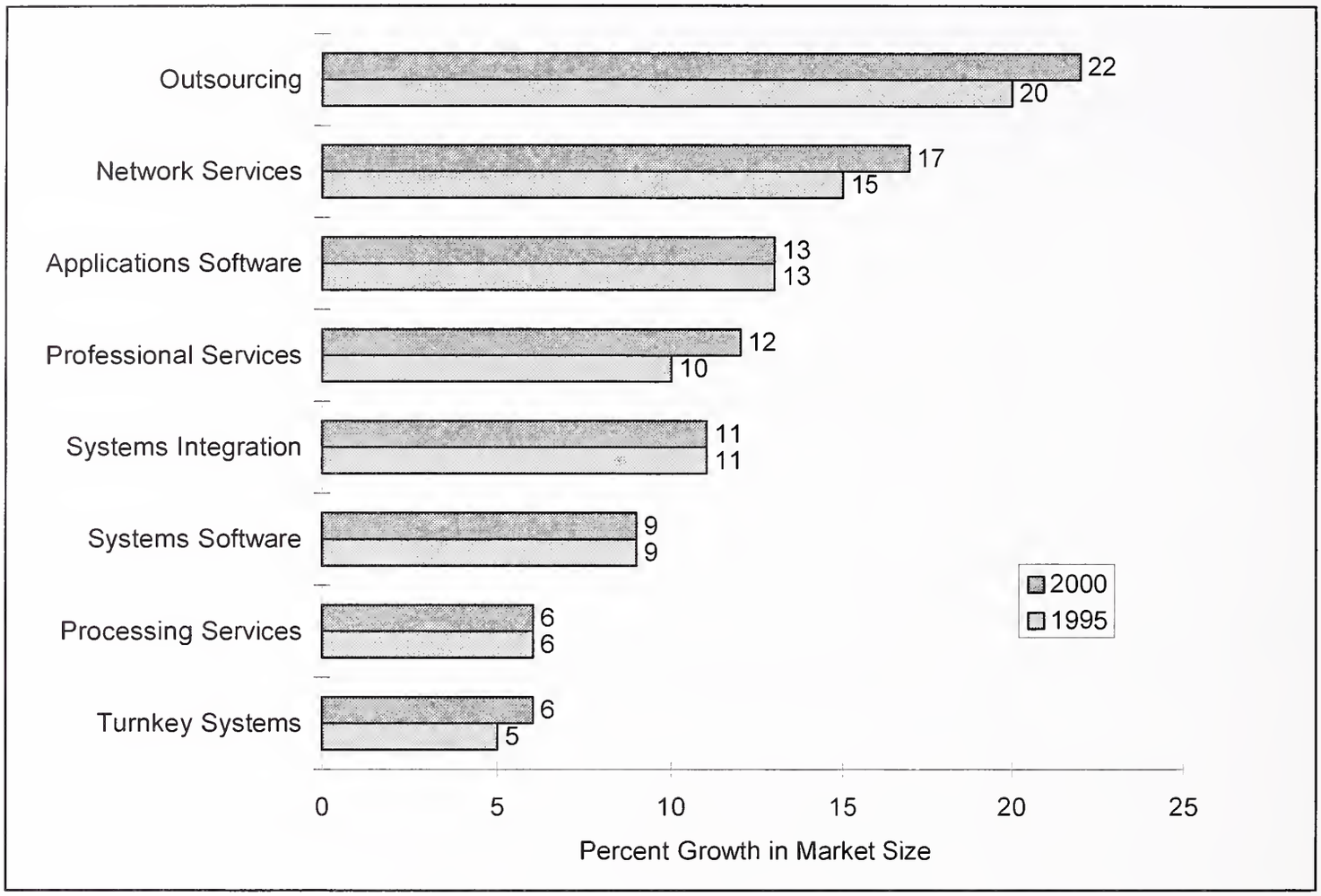
Exhibit IV-24

Growth Forecast by Utilities and Telecommunications



Source: INPUT

3. Rating Vendors Serving Telecommunication/Utilities

Vendors of information services ranked highest for their work by telecommunications/utilities are led by Andersen Consulting and IBM, as shown in Exhibit IV-25. Andersen leads primarily because of its high rating for consulting work involving systems and equipment planning for projects.

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Exhibit IV-25

Vendors of Information Services to Utilities and Telecommunications

Vendor	Relative Rating of Work by Users*
Andersen Consulting	3.9
IBM	3.8
SHL	3.6
E&Y	3.5
LGS	3.5
Digital	3.2
Price Waterhouse	3.1

**5 = High, 1 = Low* *Source: INPUT*

G
Business Services Market

1. Factors Affecting the Business Services Market

Business services users of information services report pressure to lower costs, improve services, limited funds, and the tax situation are important factors affecting the market (See Exhibit IV-26). They also report that their clients are increasing their use of business services.

Exhibit IV-26

Factors Affecting Business Services

Factor	Relative Importance to Users*
Pressure to Lower Costs	3.8
Need to Improve Service	3.7
Need to Use Client/Server	3.6
Increasing Trade	3.5
Funding Limitations	3.2
Tax Burden	3.1

**5 = High, 1 = Low* *Source: INPUT*

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Users report a need to improve customer services and lower costs as well as a need to utilize new IT that might reduce costs. These needs are all forecast to lead to greater use of information services in business services.

The technology directions reported by business services users focus on the use of client/server technology, as shown in Exhibit IV-27.

- Business services firms include many small companies that are seeking lower-cost alternatives for automation. However many larger firms in this industry have partnership structures that encourage the use of client/server capabilities.

- Several users also reported that client/server technology would be needed to enable their firms to expand services to customers.

Exhibit IV-27

Technological Directions in Business Services

Factor	Relative Importance to Users *
Use of Client/Server Technology	4.1
Reengineering	3.8
Downsizing	3.5
Network Technology	3.4
Open Systems	3.3
EDI	3.2
Imaging	2.4

**5 = High, 1 = Low* *Source: INPUT*

2. Growth of Information Services in Business Services, 1995-2000

Users expect most delivery sectors of information services used in business services to increase their rates of growth during the forecast period, as shown in Exhibit IV-28.

- Areas that won't participate in the increasing growth to a large extent include processing services and turnkey systems. Even small users want to move applications to workstation platforms from these delivery modes.

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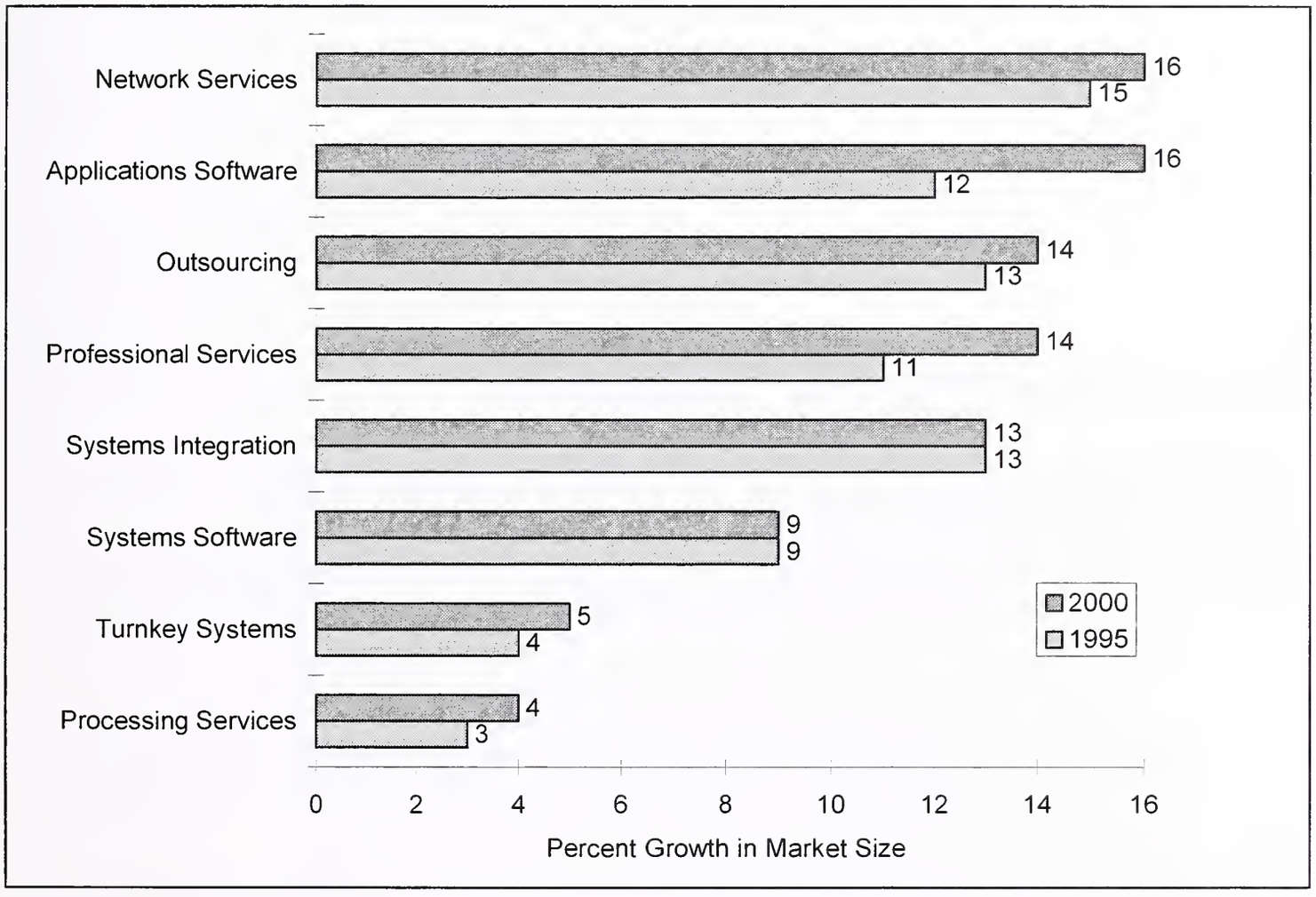
- The use of professional services in this market will grow at an above average rate since many business services users seek aid customizing software products to run on workstations or client/servers.

Exhibit IV-28

Growth Forecast by Business Services



Source: INPUT

Accounting and financial functions as well as management, reporting and customer services were also mentioned as important applications by business systems users.

3. Rating Vendors Serving Business Services

IBM, Andersen Consulting, and SHL showed the highest ratings by users in business services, as indicated in Exhibit IV-29, and have the largest market shares in business services. IBM and SHL also supply equipment, which is important to a number of users in the business services market, who are generally interested in one-stop shopping and support from IT vendors.

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Exhibit IV-29

Vendors of Information Services to Business Services

Vendor	Relative Rating of Work by Users*
IBM	3.8
Andersen Consulting	3.5
SHL	3.5
DMR	2.4
Digital	2.1

**5 = High, 1 = Low* *Source: INPUT*

H
Federal Government and Other Market Sectors

1. Factors Affecting the Federal Government and Other Market Sectors

Information services users in the federal government and other markets such as transportation and health report some issues similar to those mentioned for market sectors discussed in this section.

- Federal government users desire to cut or avoid costs and use new technology but they lack the means of funding projects. Growth of information services expenditures has been slow due to shrinking budgets.

- In health, education and other sectors, there is more willingness to spend funds for information services because users feel that information services are needed to reduce costs, improve service and restructure functions.

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2. Rating Vendors Serving the Federal Government and Selected Other Market Sectors

Exhibit IV-30 lists vendors of information services who were given a high rank for their work in the federal government and other market sectors.

- IBM and EDS are noted by federal government users. Several other vendors were recognized for federal work, but ranked at lower levels.

- Exhibit IV-30 also illustrates that large vendors are generally recognized for work in several industry sectors. There are fewer large Canadian vendors devoted to one or a few industries on a relative basis than in the U.S. Several large vendors report that it is necessary to gain a foothold in multiple industries in Canada to remain profitable.

Exhibit IV-30

Vendors of Information Services Ranked High in Other Market Sectors

Vendor	Market Sector
CGI	Federal Government, Health
Digital	Education
DMR	Education, Health
E & Y	Miscellaneous, Transportation
EDS	Federal Government, Health
IBM	Federal Government, Health
LGS	Federal Government, Education

Source: INPUT

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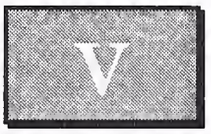

Information Services Market

This chapter reviews the use of information services delivery modes in vertical markets. Data from user respondents about the use of information services and vendors have been collected and aggregated to develop exhibits.

A
Processing Services Market

1. Factors Encouraging Use of Processing Services Vendors

The ability to turn on an automated service rapidly is the chief factor driving processing services although vendor benefits such as cost savings are equally important to users (See Exhibit V-1).

- Users report that they are looking for a rapid answer to a problem that will require little development time or consume limited internal resources.

- Users also report that they have expanded use of processing to accommodate additional applications needs when the vendor had solutions available.

Processing services are also used in a passive manner without examining the benefits of processing versus other information services by some users because the underlying functions involved are not central to the company's businesses as would be the case with such applications as processing credit card transactions or conducting seismographic research.

One category of processing services, disaster recovery, has become increasingly important to a number of industries including manufacturing, banking and finance, telecommunications and utilities.

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Exhibit V-1

Factors Driving Use of Processing Services

Factor	Relative Importance to Users*
Cost Reductions	4.1
Get Started Rapidly	4.0
Easily Available Solutions	3.8
Take Advantage of Vendor Resources	3.2

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

2. Factors Inhibiting Use of Processing Services

Clients of processing services vendors report exploring alternatives and might turn to workstation or client/server solutions as well as software products that could enable them to move processing work in-house (See Exhibit V-2).

- Some long-term users of processing services report they could reduce costs by moving work in-house or using outsourcing.
- Users also note that moving in-house with client/server technology or standalone workstations could give them opportunities to easily add other work.

Exhibit V-2

Factors That Can Inhibit Use of Processing Services

Factor	Relative Importance to Users*
Ability to Move Work In-House	4.2
Cost of Processing vs. Client/Server or Workstation	4.2
Available Software Solutions	4.0
Outsourcing Alternative	3.9

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

Vendors of processing services may have to consider strategies that would provide more incentive for continuing use of a vendor's services.

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Processing services vendors are now introducing new approaches to processing similar to those used with outsourcing which compare tradeoffs between internal work loads and external processing services to be more attractive to users.

3. Processing Services Market, 1995-2000

The growth of processing services by subsector over the next five years is indicated in Exhibit V-3.

- Transaction processing continues to grow, particularly for billing and card processing.
- Utility processing continues to grow but at a very slow rate and should not be counted upon as a source of revenue since users are ready to replace it when any opportunity becomes available.
- Disaster recovery is increasing at a rapid rate and helps to keep "Other Processing" growing at a high rate.

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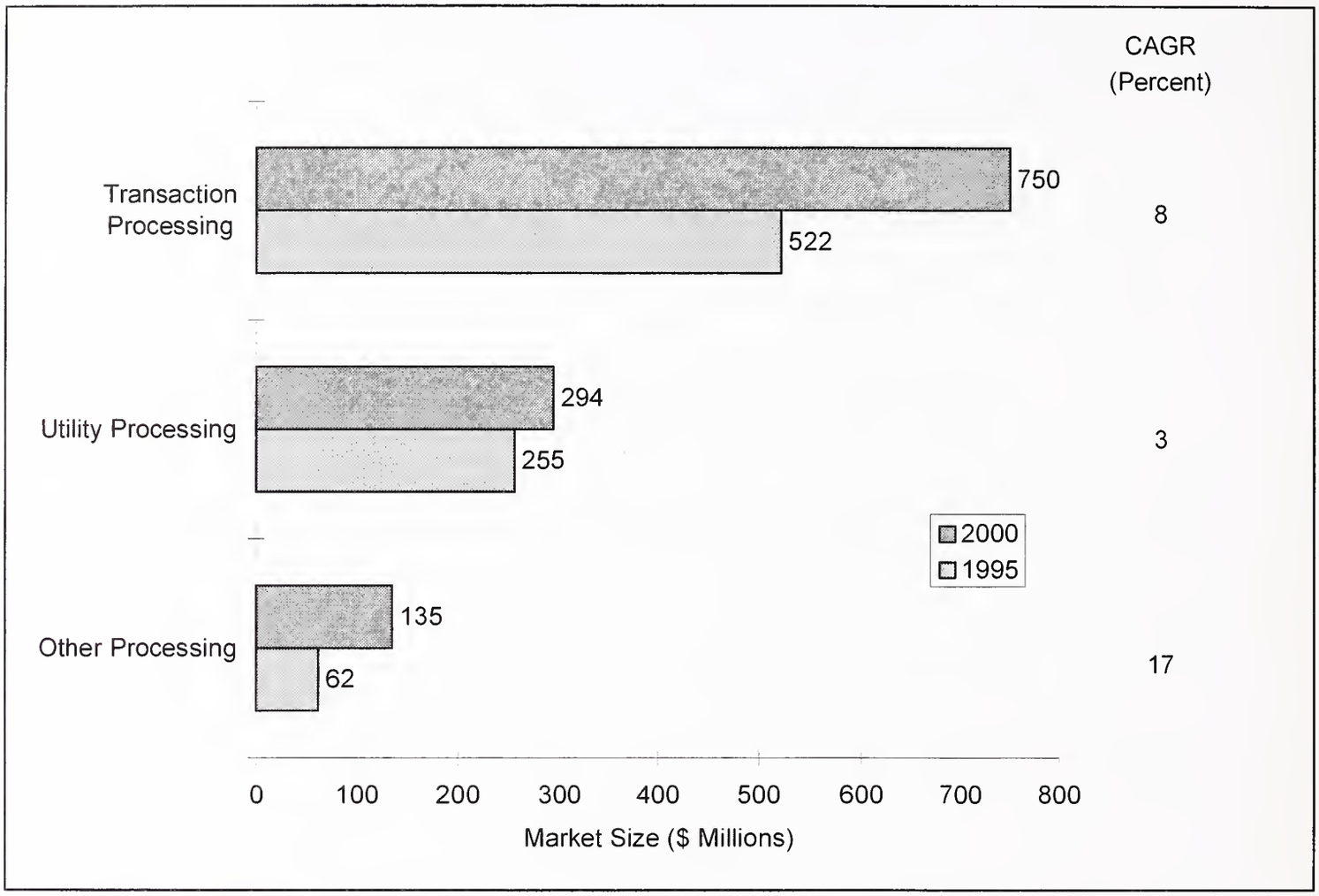
Exhibit V-3

Processing Services Submodes, 1995-2000



Source: INPUT

Other processing is growing at a faster rate than transaction processing, due chiefly to rising interest in disaster recovery and electronic off-site data storage, which is included in this category.

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4. Changes in Use of Processing Services

A list of changes in expenditures for processing services by application was estimated, as shown in Exhibit V-4, based on data supplied by users.

- In some application areas, such as financial, accounting, transaction processing and manufacturing, work is being moved in-house to client/server system or to outsourcing vendors at the same time that the use of processing services is increasing. Vendors must maintain awareness of all user plans.

- In other application areas such as payroll, a sizable percentage of the users who reported impending changes expect to decrease their use of processing services by moving applications in-house. The complexity of changing withholding and reporting requirements has been delaying this however.

- Some application areas such as transaction processing are experiencing a net decrease.

- The total volume of increased work is estimated to be in excess of the volume of decreased work.

An increase in the use of processing is shown for some applications including collection and analysis of sales prospect data, sales analysis and billing, where vendors can make use of their market and database expertise to accomplish work.

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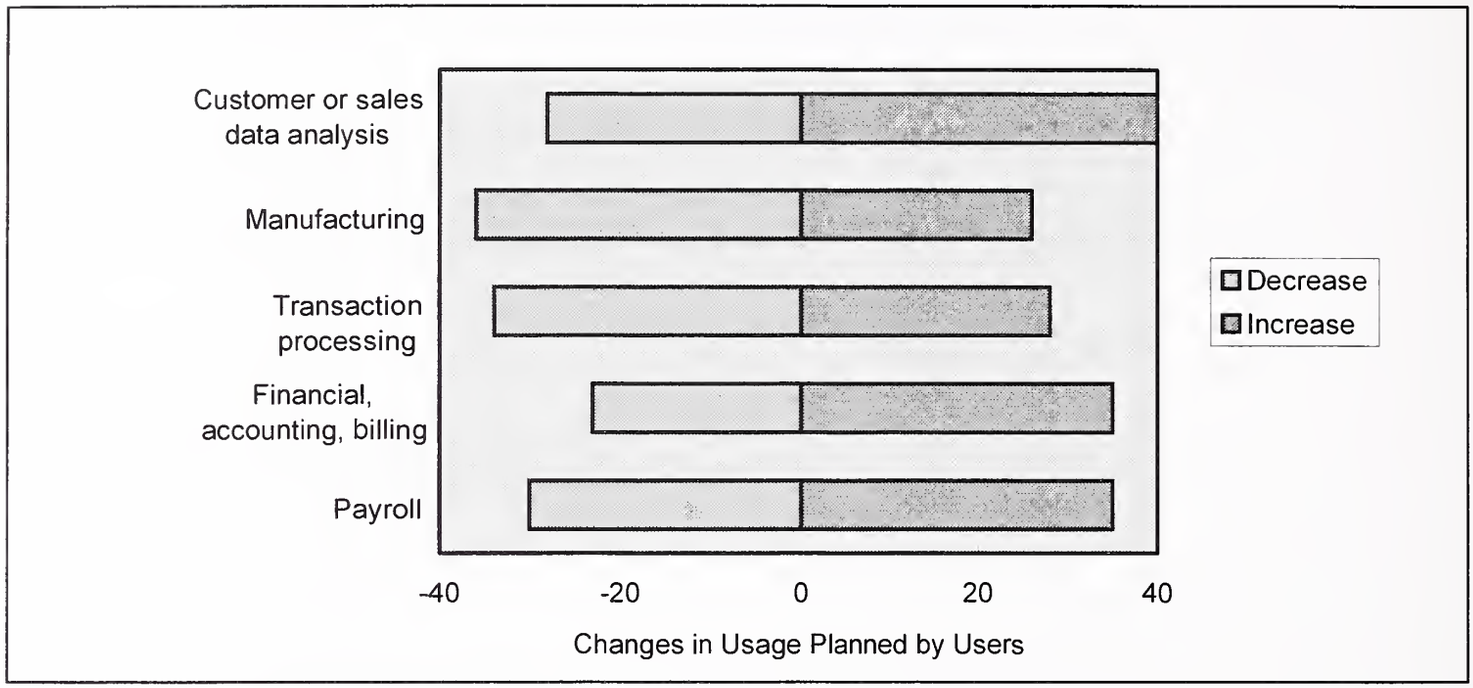
Exhibit V-4

Use of Processing Services Reported by Users



Source: INPUT

B
Turnkey Systems Markets

1. Factors Encouraging Use of Turnkey Systems Vendors

As shown in Exhibit V-5, factors that information services users report in relation to the use of turnkey systems are similar to those reported for processing services.

- Similar to the situation for processing, available solutions and vendor capabilities are important for users who feel they must meet business objectives in a short time. The relatively short implementation time for many turnkey systems is reported to be of importance in this regard.

- An ability to predict development costs and plan cost savings through the use of a turnkey is also important to users. Several users report that they were able to accurately determine what costs and savings would be by inspecting the use of turnkeys at other companies.

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Exhibit V-5

Factors Driving Use of Turnkey Systems

Factor	Relative Importance to Users*
Available Solutions	4.4
Cost Savings	4.1
Fast Implementation	3.8
Client/Server Solution	3.8
Experience of Vendor	3.7

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

Users also report that turnkey systems offer an opportunity to obtain an in-house solution that can be upgraded.

2. Factors Inhibiting Use of Turnkey Systems

Some users feel that turnkey solutions have limitations, as indicated in Exhibit V-6.

- Limitations reported by user respondents included transaction processing speed, data base capacity, report formats, and portability.
- Users also report limitations in upgrading solutions to utilize new or different platforms or new types of software products. Users may want to use client/servers, but cannot move solutions to them.

Exhibit V-6

Factors That Can Inhibit Use of Turnkey Systems

Factor	Relative Importance to Users*
Software Solution Purchased Independently of Equipment	4.1
Limited Solution with Turnkey	3.8
Limitations in Upgrading	3.5
Focus on Client/Server	3.5

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

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Some users also noted that the use of turnkey systems could result in too great a commitment to a vendor. They felt that the vendor commitment could exert pressure on users to follow the equipment and/or application directions that the vendor decided were best for applications upgrades.

3. Turnkey Systems Market, 1995-2000

The growth in use of turnkey systems shown in Exhibit V-7 indicates that the cost of the equipment component of the solution is not growing as fast as the software or professional services components.

- This situation is mostly due to the decreasing cost of equipment solutions. Many turnkey systems are now available on client/server systems and standalone workstations that were formerly available only on mainframes or minicomputers.

- The number of software features and the ability to customize delivered solutions with professional services work are also growing in importance to users relative to equipment vendor alternatives.

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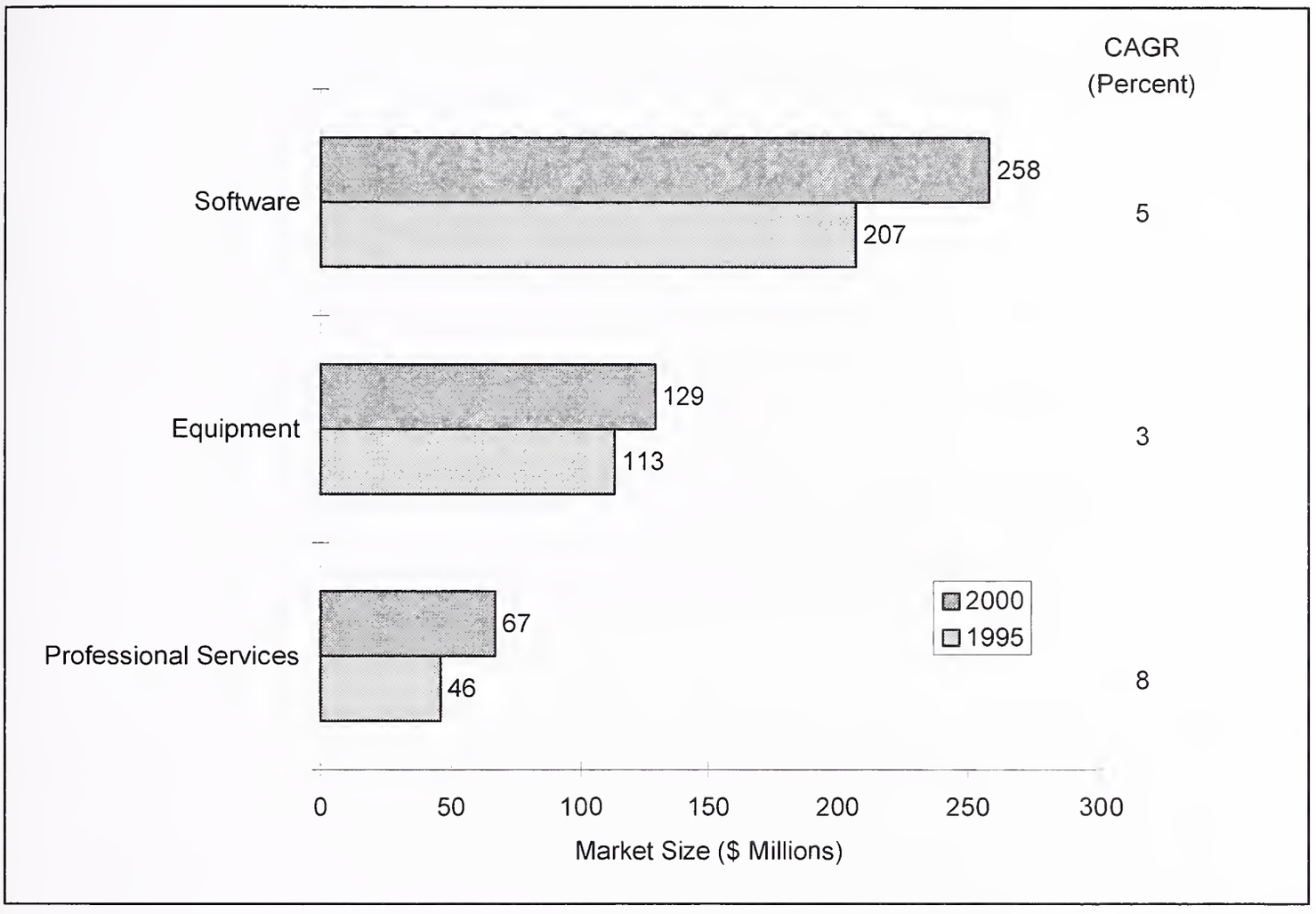
Exhibit V-7

Turnkey Systems Submodes, 1995-2000



Source: INPUT

Although expenditures for turnkey systems are not growing as rapidly as those for other delivery modes, there is still growth in use forecast for these solutions.

4. Changes in Use of Turnkey Systems

The size of changes in use of turnkey systems in relation to application areas are estimated in Exhibit V-8.

- There are still areas where turnkey systems are increasing in use on a net basis such as sales analysis.
- The decreases in use often involve a movement of work to in-house client/server technology. Users report that these moves provide an opportunity to expand applications.

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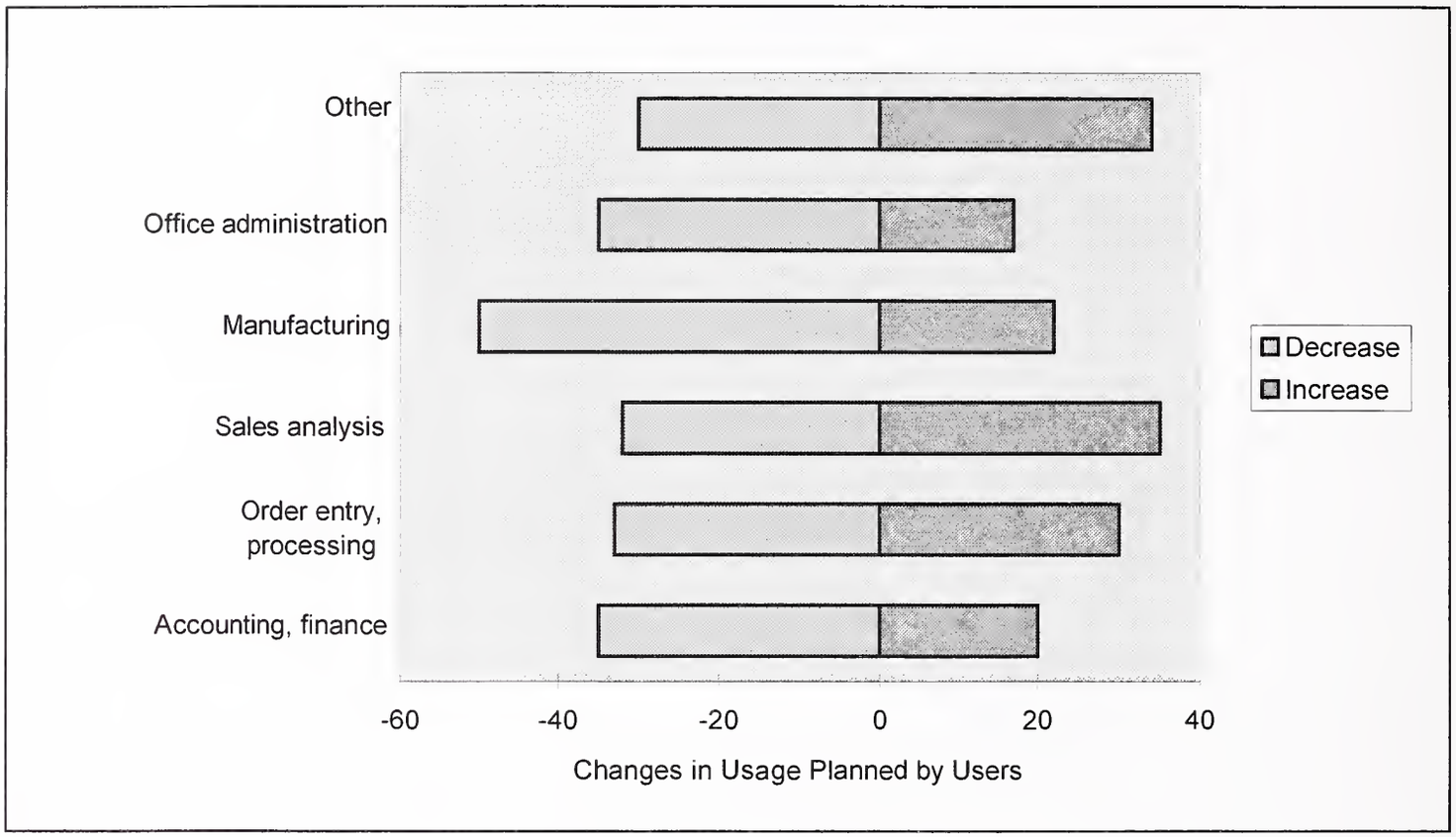
Exhibit V-8

Use of Turnkey Systems Reported by Users



Source: INPUT

Some increases in turnkey usage were made with turnkeys on workstations or client/servers. There was also some increased use of mainframe and minicomputer turnkey solutions in manufacturing, accounting and order processing functions reported, but most vendors involved with these solutions are implementing or exploring downsized solutions.

C
Applications Software Products Market

1. Factors Encouraging Use of Applications Software Products Vendors

Users point to the availability of software for client/server technology as the prime reason for using applications software products, as shown in Exhibit V-9. Users report they want a set of features that meet their needs. Integration is also needed, particularly with client/server. The success of the integrated, feature-rich functions of SAP software testifies to the need to satisfy both factors.

Some users noted interest in object-oriented techniques, but these techniques are not dictating choice of products as yet.

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Exhibit V-9

Factors Driving Use of Applications Software Products

Factor	Relative Importance to Users*
Availability of Client/Server Solutions	4.4
Integrated Capabilities	4.2
Software Features/Functions	4.0
Can't Wait for Development	3.8
Lower Development Costs	3.8
Range of Features	3.6

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

Users did report that another factor encouraging the use of applications software products in general was the ability to lower development costs by using vendor products instead of developing software solutions in-house.

2. Factors Inhibiting Use of Applications Software Products

Many users are less likely to acquire application software products that will require a high level of modification, as illustrated in Exhibit V-10. The acquisition of software products could also be inhibited if there was a possibility of changing to an equipment platform that could not run the software products. Decisions for mainframe software have been canceled for that reason according to respondents. Outsourcing can also inhibit the acquisition of software, of course.

The ability of vendors to support software products in the future could also inhibit decisions in some corporate situations, as indicated in Exhibit V-10. Users investigate the ability to support software much more thoroughly at this time. There is, however, increasing willingness to rely on software products if questions about support platforms and integrated functions are addressed.

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Exhibit V-10

Factors That Can Inhibit Use of Applications Software Products

Factor	Relative Importance to Users*
Use of Outsourcing Vendor	4.2
Amount of Modification Needed	4.0
Plans to Change Platforms	3.9
Lack of Support by Vendor	3.7
Lack of Confidence in Vendor	3.6

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

3. Applications Software Products Market, 1995-2000

The breakdown of the applications software products market shown in Exhibit V-11 emphasizes that products for workstation/PC platforms are growing much more rapidly, than for larger platforms.

- By 2000, application software products on workstations/PCs will account for over 60% of all expenditures in this delivery sector.

- Application products for workstations and client/server systems are becoming available for many business functions, including human resources, integrated accounting, trust, commercial loan, distribution and material management, according to respondents. There is a limited set of integrated business modules available for client/servers and workstations from vendors, at present, and SAP is profiting greatly from this, according to respondents.

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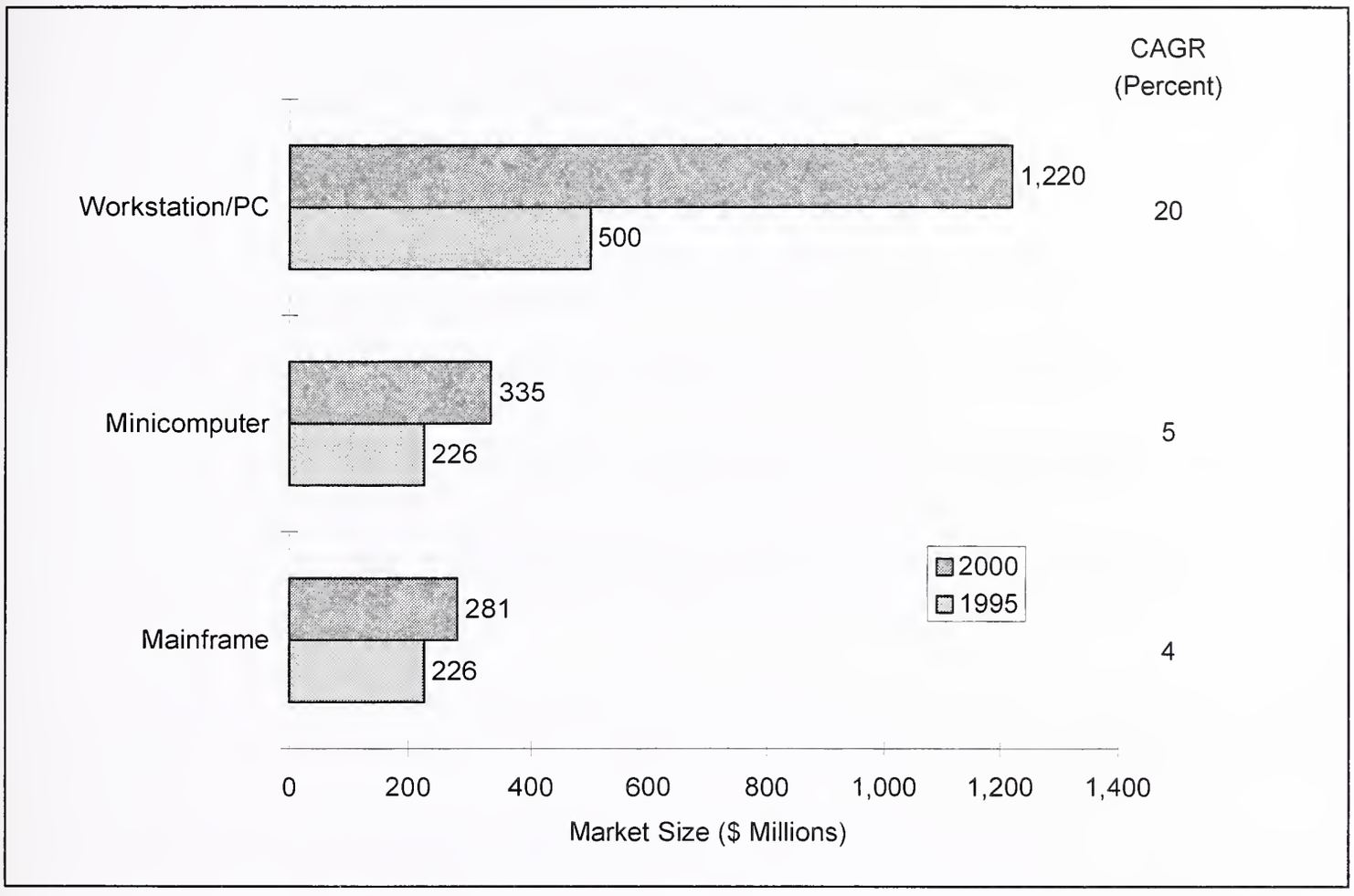
Exhibit V-11

Applications Software Products Submodes, 1995-2000



Source: INPUT

4. Changes in Use of Applications Software Products

There is much more increase than decrease in the use of software taking place, as shown in Exhibit V-12.

- Some decrease is taking place through the use of professional services or SI.
- Many of the increases in use are involved with an integrated system utilizing a data base. Most of these increases involve client/server platforms, but some are still reported to be involved with mainframe and minicomputer platforms.

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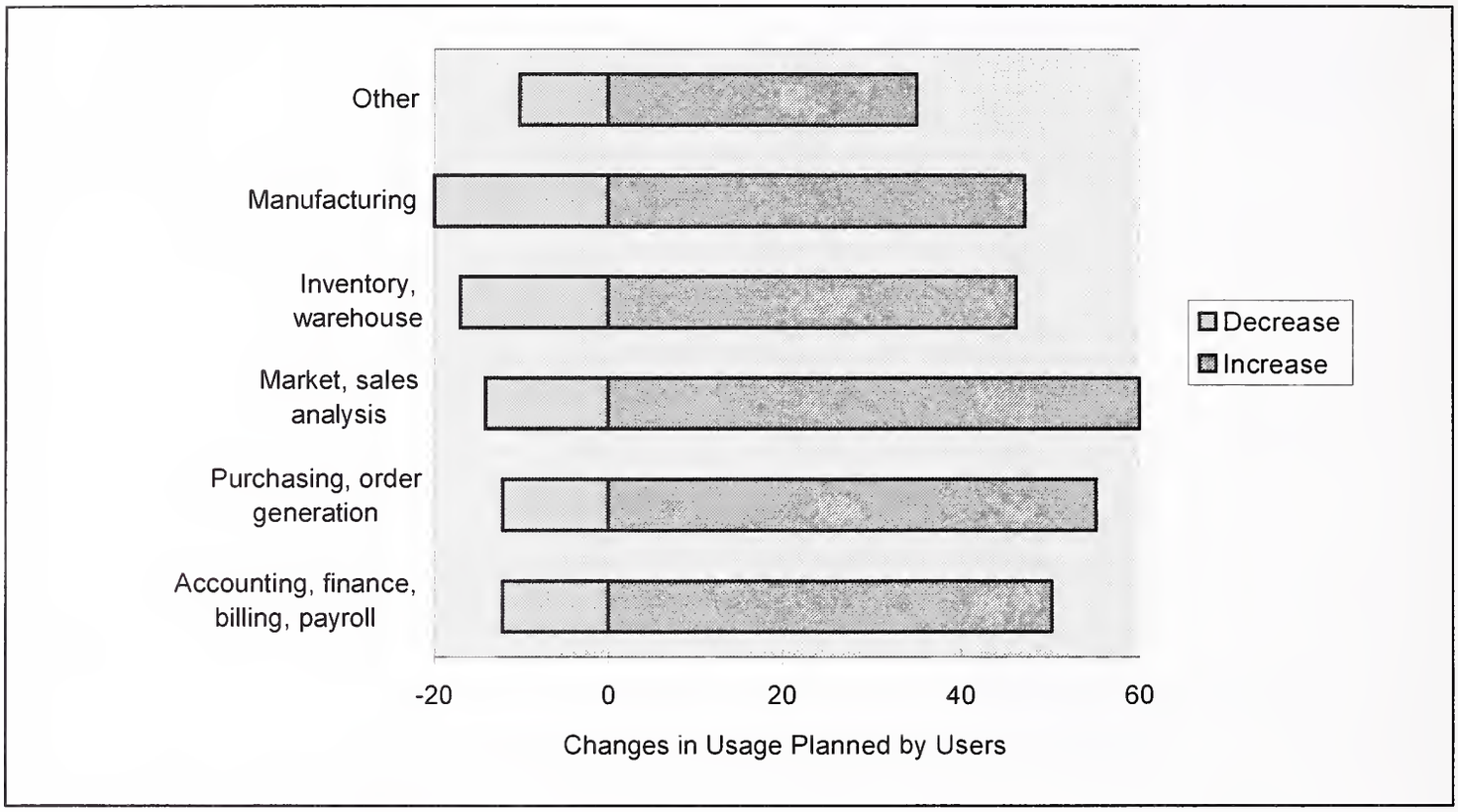
Exhibit V-12

Use of Applications Software Products Reported by Users



Source: INPUT

Respondents reported planned increases in software product use for many application areas in addition to those highlighted in Exhibit V-12, including bank lending, investment, portfolio management/reporting, logistics, material management, work scheduling, order entry, POS, ATM networks, EDI, trust, insurance agency operation, customer service, and manufacturing applications.

D
Outsourcing Market

1. Factors Encouraging Use of Outsourcing Vendors

Increasing interest in using outsourcing often involves a long term evaluation particularly if a large activity is involved, according to users. One of the considerations that is explored in detail is the possibility of reducing IS and user costs.

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Exhibit V-13

Factors Driving Use of Outsourcing

Factor	Relative Importance to Users*
Cost Reduction	4.2
Improvement of Process	4.1
Vendor Expertise/Ability to Aid	4.1
Improved Operations	3.8
Complexity of Technology	3.7

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

- The rating of factors driving the use of outsourcing, shown in Exhibit V-13, illustrates that cost savings is a major factor.

- Improved processes and/or operations and the ability to rely upon the expertise of vendors in the use of IT also rank high as reasons for using outsourcing.

Many users also feel outsourcing is a means of dealing with new technology because vendors are committed to maintaining a research staff that can stay up to date on new capabilities. This addresses one of the issues that information systems users identified as a major challenge during this study: handling the complex changes in IT equipment and services that are regularly occurring. Vendor expertise has led to the introduction and rapid growth of outsourced services to aid with desktop computing and network management.

A factor that must be considered in relation to outsourcing is the rapid rise in business process outsourcing.

- This is generally used for non-core functions in business such as human resources, sales, mail operations and accounting, but could also address major processes.

- The service is generally provided by IT vendors, but may involve much more non-IT work than IT activities.

- It could add substantially to outsourcing revenues. Only the IT component was estimated and included in report data in the past.

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2. Factors Inhibiting Use of Outsourcing

As indicated in Exhibit V-14, users mention reservations about the use of outsourcing that could inhibit business.

- Loss of control of the use of IT is a major deterrent. Many users feel that outsourcing vendors might be the ones who made decisions about whether systems upgrades or new applications could be implemented to meet business needs.

- Some companies also feel that it may be very difficult to change vendors or reverse the move to outsourcing once a vendor starts to take over responsibility for operations or applications.

Exhibit V-14

Factors That Can Inhibit Use of Outsourcing

Factor	Relative Importance to Users*
Loss of Control of IS Use	3.6
Amount of Work to Move Back Inside	3.4
Difficulty to Change Vendors or Delivery Modes in Use	3.4
Length of Commitment	3.2

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

3. Outsourcing Market, 1995-2000

Exhibit V-15 indicates the new sectors of desktop services and network management are growing rapidly. User expenditures are also rising less rapidly for applications outsourcing than for platform outsourcing, reversing earlier trends.

- The platform sector involves the operation and possible ownership of platform capabilities for a corporate department or IS function on a long-term basis.

- The applications sector involves the provision of staff capabilities to handle modification and development of the applications systems that are being run, as well as, operational responsibilities.

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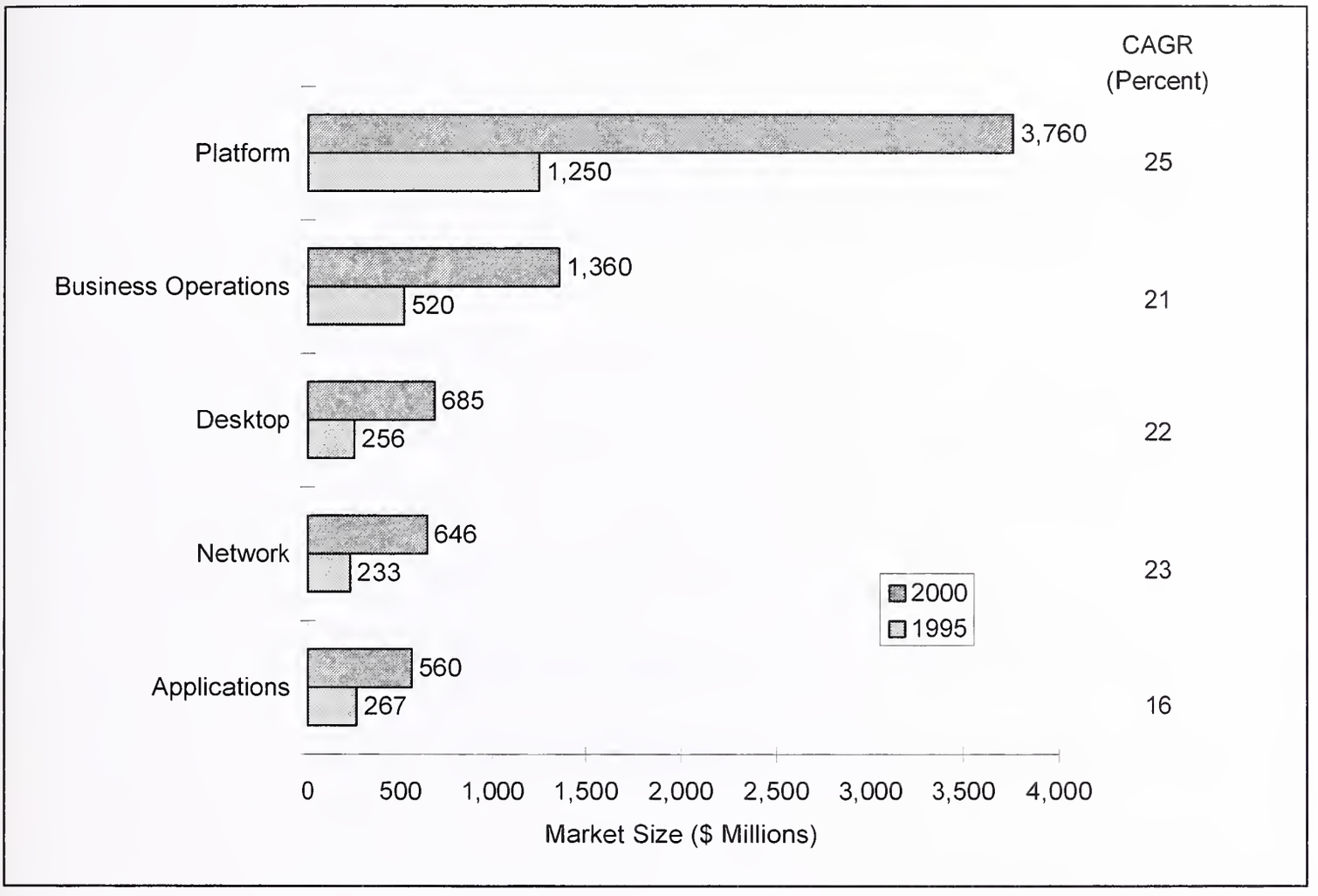
Exhibit V-15

Outsourcing Submodes, 1995-2000



Source: INPUT

4. Changes in Use of Outsourcing

The changes in use planned in regard to outsourcing are only concerned with increases, as Exhibit V-16 indicates.

- Users report they are considering alternatives to outsourcing for some applications including financial, trust and manufacturing work, but are not planning decreases in outsourcing.

- In several situations, users reported that they might stay in-house and use systems integration, or professional services if vendors can meet their needs rather than count on an outsourcer.

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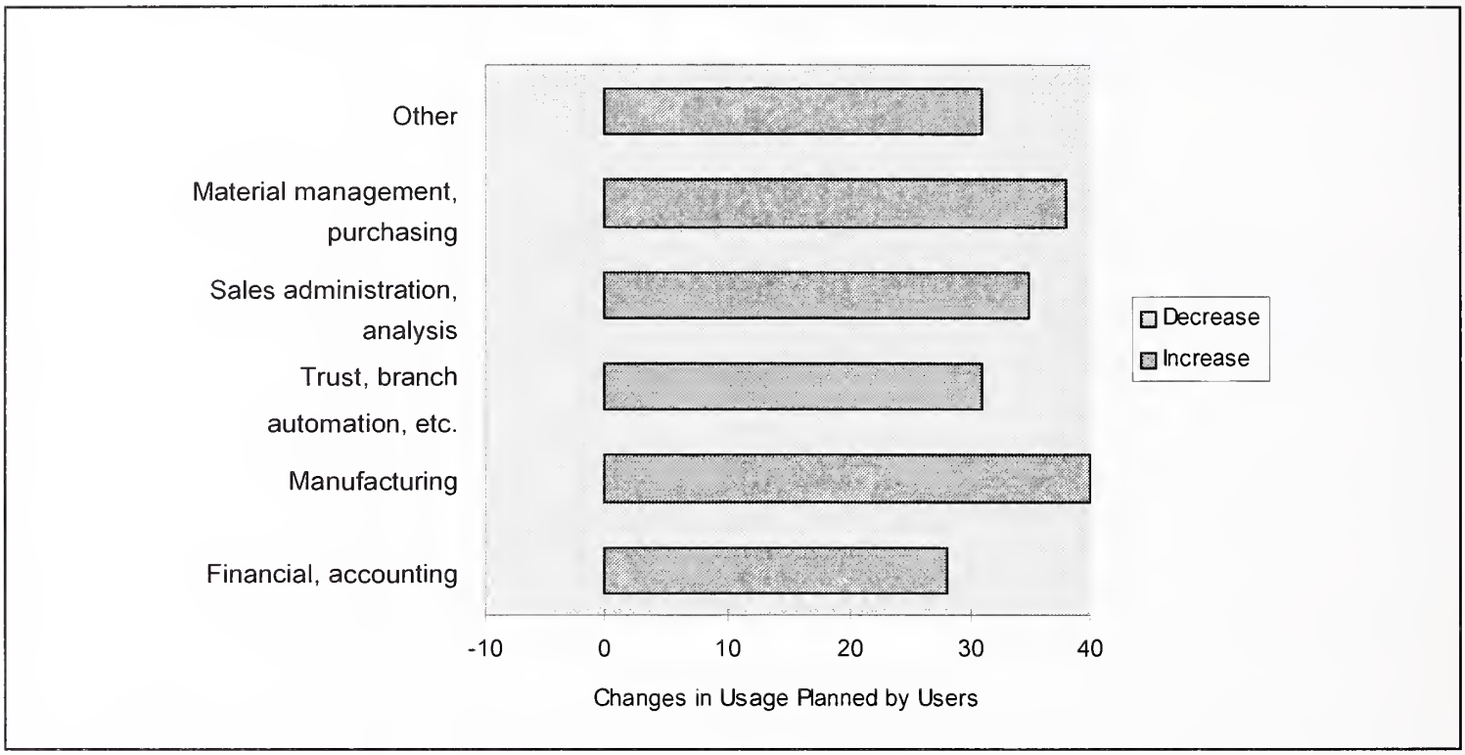
A number of application areas being considered for outsourcing are regarded as important to the companies involved, and management is inclined to rely on or at least consider large outsourcers for aid. Several users also emphasized that they were interested in the expertise of vendors for MRP, material management, integrated accounting, distribution and other systems.

Exhibit V-16

Use of Outsourcing Reported by Users



Source: INPUT

E
Systems Integration Market

1. Factors Encouraging Use of Systems Integration Vendors

Some information services users report that they consider the use of systems integration to analyze and implement complex systems where expertise in a number of areas is required, including the industry/ application software products that might be used, network components of the solution, and platforms and tools that could be involved.

- Users emphasize the need to implement computer systems, industry/application knowledge, technical expertise, and vendor ability to rapidly implement as factors for using vendors, as indicated in Exhibit V-17.

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- A systems integrator can also enable users to make more effective use of their own resources since the integrator will take responsibility for meeting the needs of the project.

Exhibit V-17

Factors Driving Use of Systems Integration

Factor	Relative Importance to Users*
Need to Implement Complex Systems	4.3
Faster Implementation	4.1
Need for Industry/Application Expertise	4.0
Need for Technical Expertise	4.0
Less Risk	3.8

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

2. Factors Inhibiting Use of Systems Integration

The higher cost of SI projects, as well as the possible loss of control of projects, can inhibit SI as indicated in Exhibit V-18.

- Feelings of loss of control can result when an in-house staff gains only limited experience of the technology and approaches used in applications.

- Integrators can incorporate material on their education and technology transfer programs in presentations to lessen worries of loss of control.

A small group of users report they are unhappy about SI projects due to the limitations of vendors that they utilized.

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Exhibit V-18

Factors That Can Inhibit Use of Systems Integration

Factor	Relative Importance to Users*
Higher Costs	4.0
Less Control of Costs	3.7
In-House Staff Gains Limited Experience	3.3

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

3. Systems Integration Market, 1995-2000

The increase in SI from 1995 to 2000, can be broken down into the increases in delivery subsectors shown in Exhibit V-19.

- Professional services will become the leading subsector by 2000 since it is growing more rapidly.
- Software expenditures are also growing faster than equipment expenditures, but will remain about half of the amount spent on equipment on average. In some cases where smaller platforms are involved, the software products represent a higher percentage, however, and users are still becoming adjusted to that possibility.

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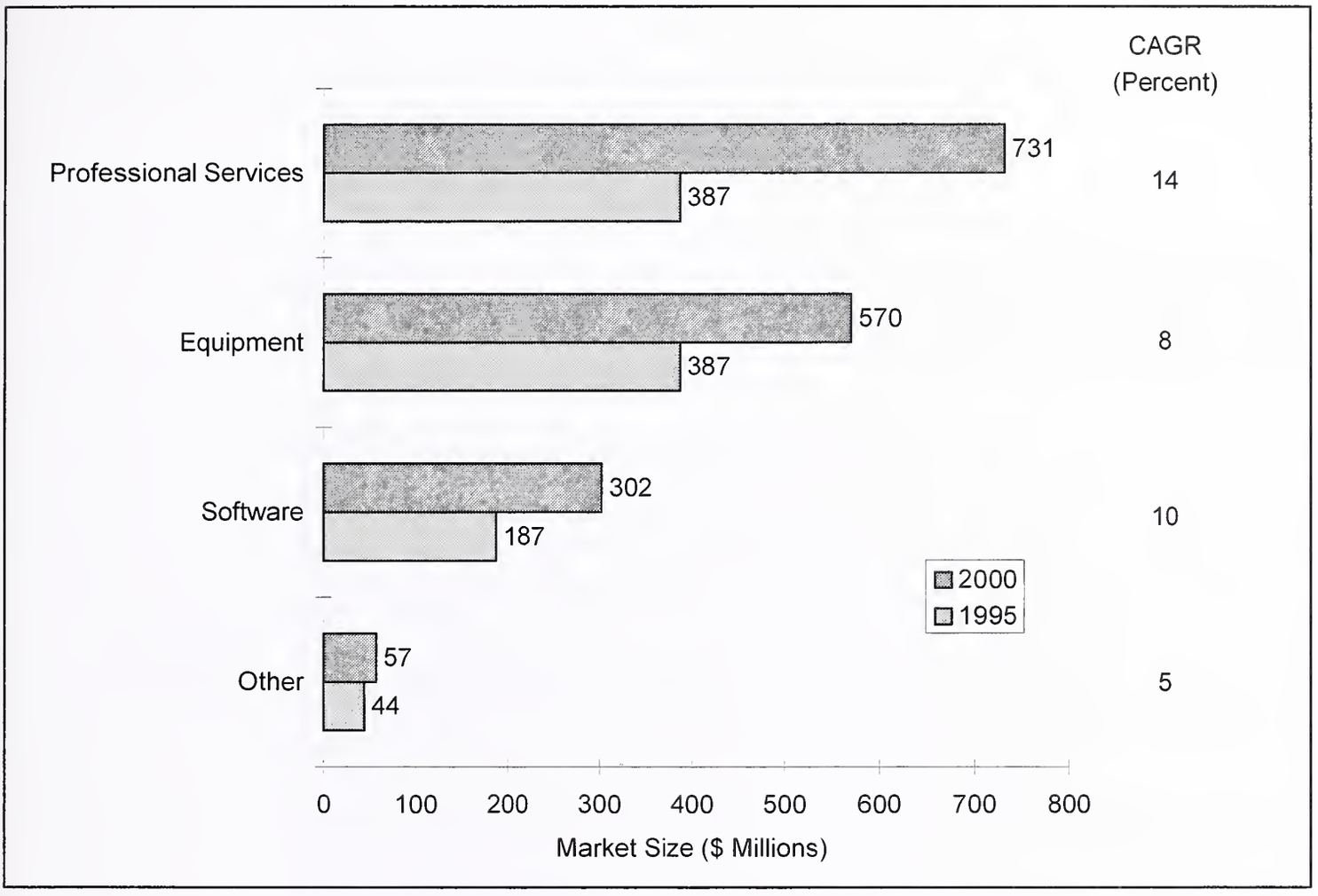
Exhibit V-19

Systems Integration Submodes, 1995-2000



Source: INPUT

In both SI and professional services projects, changes are taking place in the value of equipment. In 1993, about 25% of these projects involved client/server technology or standalone workstations. By 2000, over 80% will, according to forecasts. The growth rate for equipment expenditures will shrink as a result.

4. Changes in Use of Systems Integration

Respondents report that, there will be increases as well as decreases in the use of systems integration (SI), as shown in Exhibit V-20.

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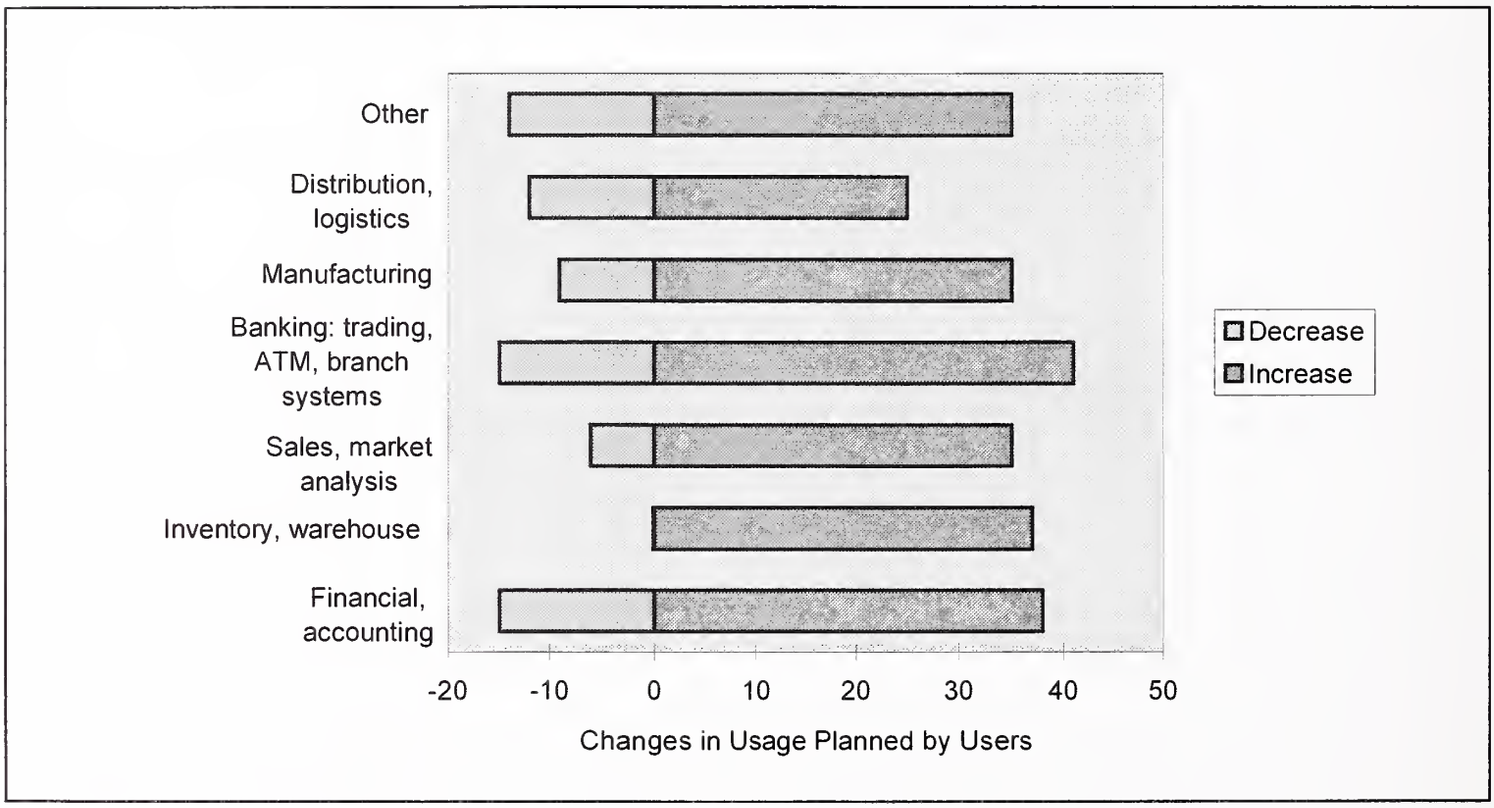
- In general, users involved in financial and banking projects plan the greatest increase in their use of SI. All application areas forecast increases, however.
- Users with current projects tend to forecast increases, even though decreases will occur as projects are finished.
- Users that have had unfavorable experiences with SI projects due to vendor deficiencies forecast decreases in use.

Exhibit V-20

Use of Systems Integration Reported by Users



Source: INPUT

F
Professional Services Market

1. Factors Encouraging Use of Professional Services Vendors

Increasing need for aid with IT technology and application development or modification encourages organizations to use professional services, as illustrated in Exhibit V-21.

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- Many users report that their needs are divided between application and technical expertise.
- Some users report that the need that sends them to professional services firms is for technical skills, such as experience with object-oriented techniques or network technology.

Exhibit V-21

Factors Driving Use of Professional Services

Factor	Relative Importance to Users*
Need for Knowledge and Industry Expertise	4.4
Desire to Hold Personnel Level Down	4.3
Aid Needed with Client/Server	4.2
Need for Technical Knowledge	4.2

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

2. Factors Inhibiting Use of Professional Services

Plans to use professional services can be inhibited by shortages of funds or lack of confidence in vendors, as indicated in Exhibit V-22.

Plans to use SI or outsourcing can also reduce use of professional services.

- Turnkey systems, processing or applications software products are also reported to lessen use of professional services to a smaller extent.
- This was reported in some cases where users have modified or used facilities available with software to tailor systems to meet their needs, rather than use professional services to customize.

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Exhibit V-22

Factors That Can Inhibit Use of Professional Services

Factor	Relative Importance to Users*
Cost	4.2
Interest in Outsourcing	3.7
Interest in Software or SI Vendor Solution	3.5

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

3. Professional Services Market, 1995-2000

The 11% CAGR forecast of growth for professional services over the next five years is accompanied by increases in consulting and education and training, as shown in Exhibit V-23.

- Education and training will enjoy a growth rate of 12% as a result of continuing interest in training in software products used for downsizing and client/server systems. This training is being provided by firms dedicated to education and training as well as SI and professional services firms interested in using education/training to support products as well as penetrate accounts further. One major vendor highlighted that strategy in regard to client/server initiatives.

- Consulting is growing in use at a 12% rate also, due to the growing need for planning to support changes in the use of IT brought about by business reengineering. Some users stated that they also needed aid in planning to restructure functions for client/server systems.

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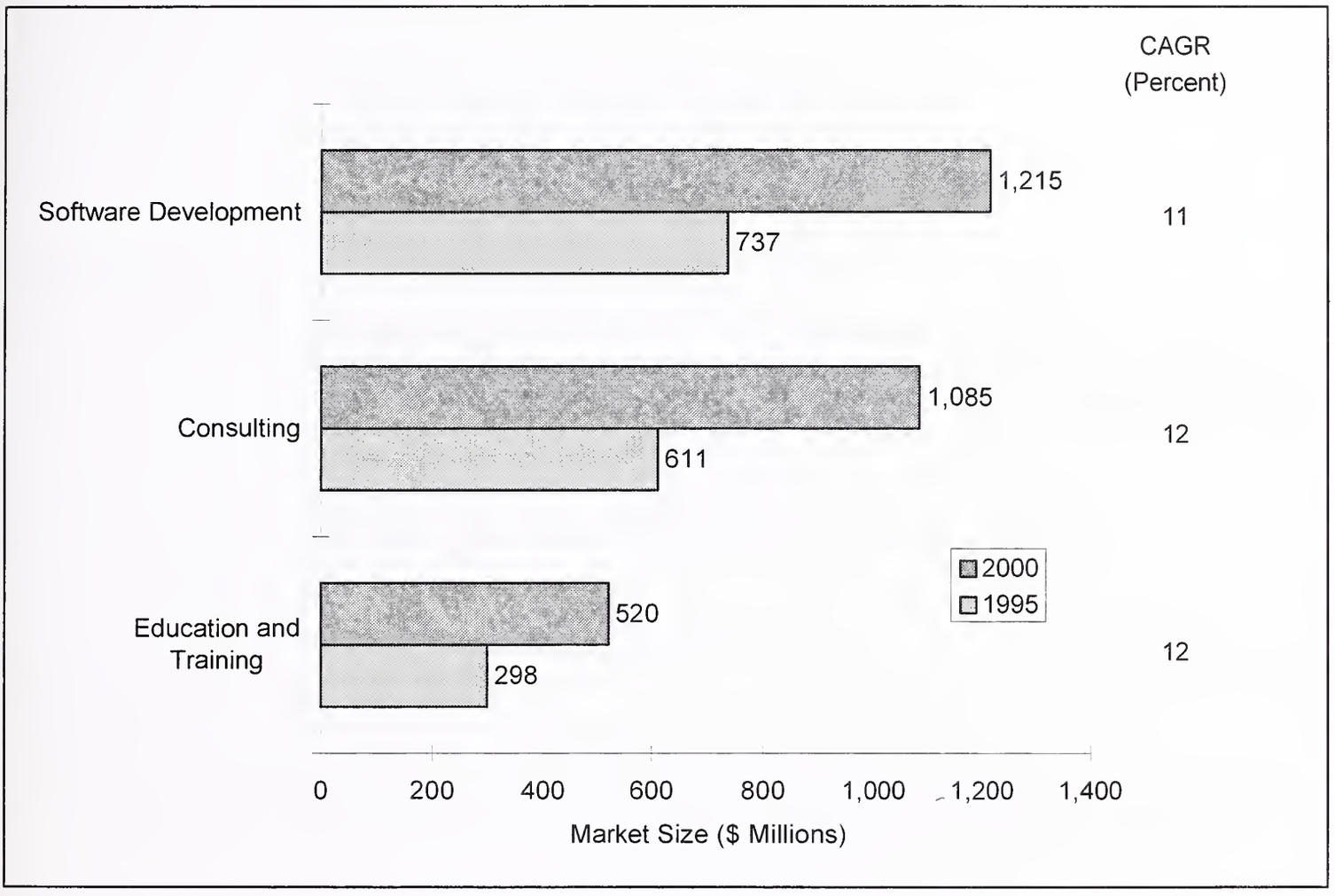
Exhibit V-23

Professional Services Submodes, 1995-2000



Source: INPUT

4. Changes in Use of Professional Services

The application areas in which users will increase their use of professional services in order to enhance, upgrade or in some cases, develop applications as well as to provide consulting and education/training services are shown in Exhibit V-24.

- Some users prefer SI and application software products for new development, but software products may be accompanied with professional services to customize solutions.
- Some vendors report that they have specialties in customizing certain software products.

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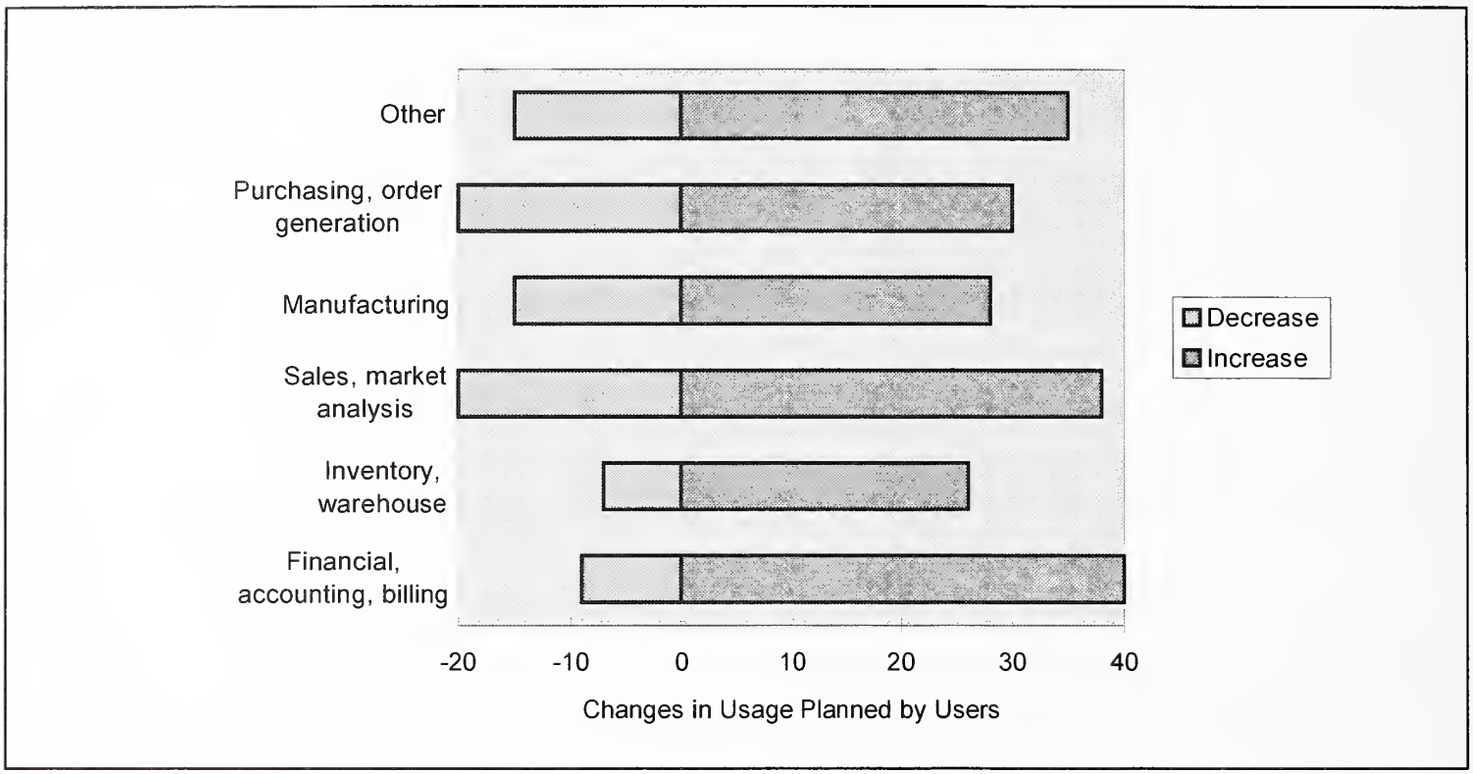
Exhibit V-24

Use of Professional Services Reported by Users



Source: INPUT

Exhibit V-24 shows that users plan to have decreases as well as increases in the use of professional services in most application areas. There is no assurance of continuing assignments.

- Education/training expenditures at a number of respondents stay at high levels or grow, from year to year. Together with the current need for client/server related education, this has provided a good opportunity for continuing work for professional services vendors.

- Consulting assignments continue to grow, as noted before, although they tend to grow rapidly and then decrease at a user's site as assignments finish. Some vendors try to secure ongoing work or have add-on training work to counter this.

G
Network Services Market

1. Factors Encouraging Use of Network Services Vendors

Demand for specific network services such as EDI or EIS (electronic information services or on-line data bases of information) is the primary driver for this delivery sector, as shown in Exhibit V-25.

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- Cost benefits of using EDI for ordering and payment and EIS to supply pricing or industrial information also drive these services.

- Vendors anticipate that the interest of corporate users and individuals in new multimedia features will increase interest in using these services. AT&T and MCI as well as other carriers and a wide range of IT vendors, including Microsoft, have been promoting new capabilities in network services.

Exhibit V-25

Factors Driving Use of Network Services

Factor	Relative Importance to Users*
Demand for EDI and Online Databases	3.9
New Features, Including Multimedia	3.9
Cost Benefits	3.6
Expanding Network Use	3.5

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

2. Factors Inhibiting Use of Network Services

As shown in Exhibit V-26, there are also factors reported that could inhibit use of network services, including attempts to use internal capabilities.

- Despite limitations, fax is in use in place of EDI in some companies.

- There has been reluctance in some companies to use vendors for E-mail and VANs since they are concerned about security.

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Exhibit V-26

Factors That Can Inhibit Use of Network Services

Factor	Relative Importance to Users*
Use of Internal Systems	3.3
Inadequate Capabilities	3.2
Reluctance to Use Vendors	2.5

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

3. Network Services Market, 1995-2000

The growth of expenditures for network services is fueled by the growth of both network applications and EIS as shown in Exhibit V-27.

- Network applications is the largest subsector and is growing at a faster rate. Expenditures for it are fueled chiefly by interest in EDI, but growth is also contributed by VANs (value-added networks) and electronic mail.

- Online data bases of all kinds contribute to the growth of EIS, but the users claim services providing equity prices and other financial information are the most significant.

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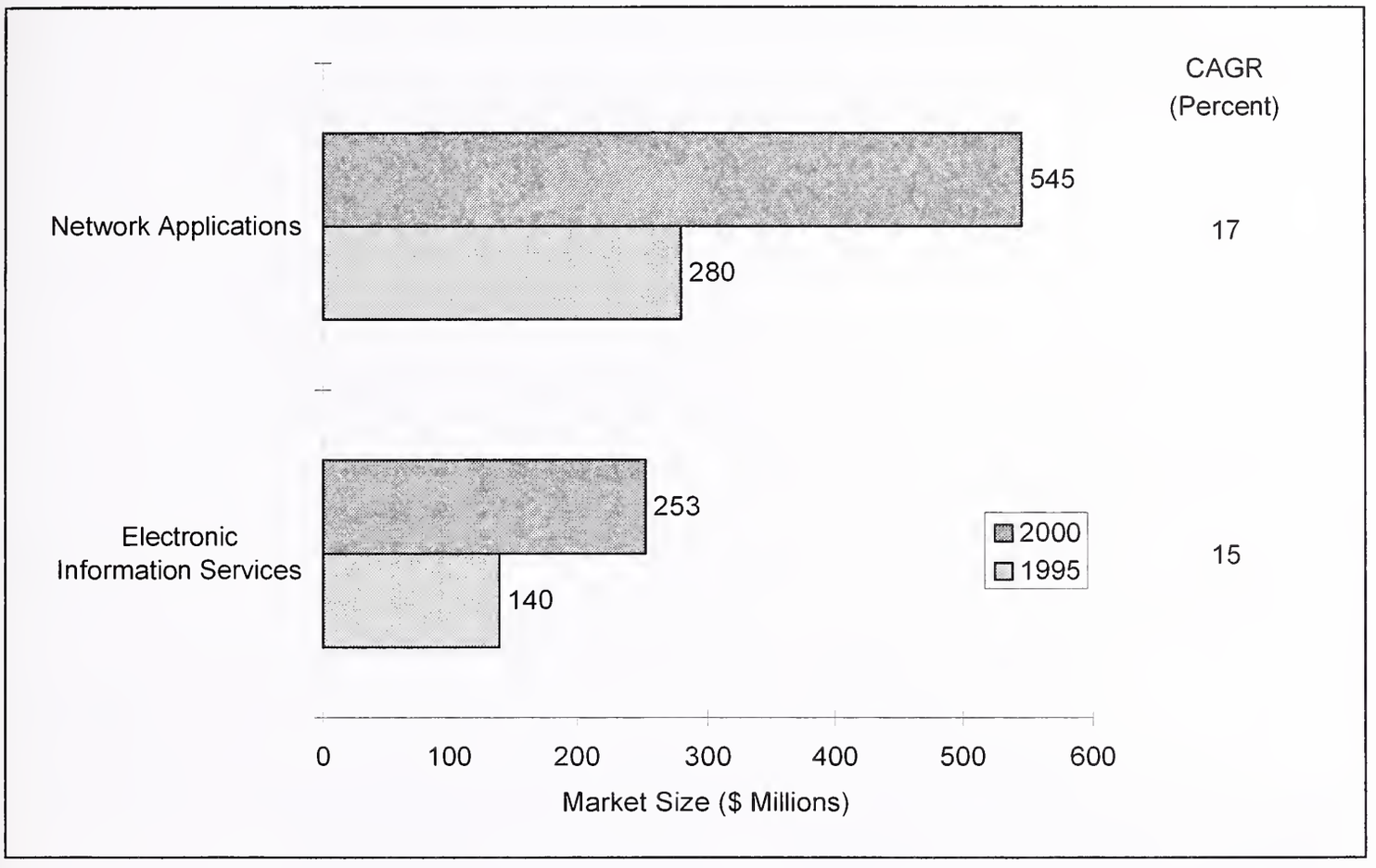
Exhibit V-27

Network Services Submodes, 1995-2000



Source: INPUT

4. Changes in Use of Network Services

Respondents report only planned increases in use of network services, as shown in Exhibit V-28.

- Increased use of EDI is mentioned frequently by users in manufacturing, wholesale and retail trade and banking/finance.
- Increased use of EDI was also mentioned by some users in business services, transportation, utilities and "miscellaneous" market sectors.
- Many users plan some increase in EIS use. Part of this use is reported as experimental or trial, but there is strong commitment to the expansion in use of financial data as well as data bases of corporate information that can be used in sales activities.

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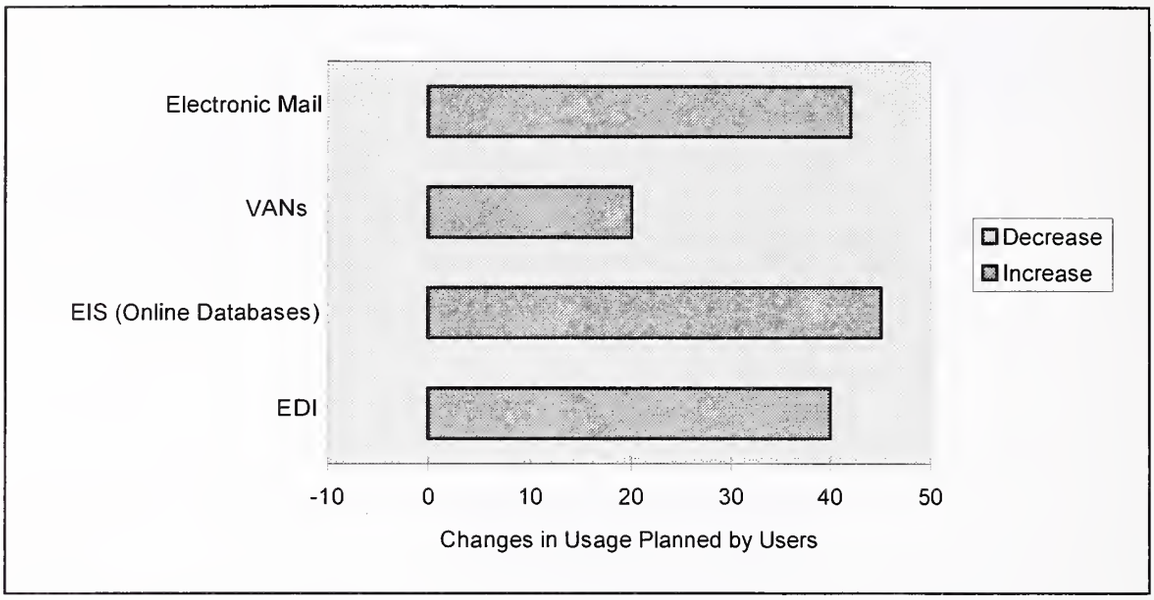
Exhibit V-28

Use of Network Services Reported by Users



Source: INPUT

Banking, insurance, manufacturing, utilities, business services and distribution users mentioned increases in use of EIS or on-line data bases of financial, industrial and other information that could be driven by new multimedia or interactive features. Users also mentioned that they had plans in regard to EDI, VANs and electronic mail that could take advantage of these capabilities.

H
Systems Software Products Market

1. Factors Encouraging Use of Systems Software Products Vendors

Users report that the use of new IT is encouraging sales of systems software products as shown in Exhibit V-29.

- Users report that they are buying an increasing amount of systems software products for workstations and client/servers to support the expanding use of this technology.

- New network and data management technology is also driving purchases of system software.

Users also reported that their lack of technical expertise increased the need for software products that could help to analyze or improve performance of new technology.

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Exhibit V-29

Factors Driving Use of Systems Software Products

Factor	Relative Importance to Users*
Use of Client/Server Technology	4.3
Other New Equipment and Network Capabilities	3.6
Desire to Increase Effectiveness of Systems	3.2

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

2. Factors Inhibiting Use of Systems Software Products

Cost and data center consolidation can inhibit expenditures for systems software products, as shown in Exhibit V-30. In addition, downsizing can reduce expenditures for systems software products on an overall basis. A reduction in the growth rate of mainframe and minicomputer systems, resulting from downsizing and the use of client/server systems is bringing about decreased expenditures for systems software products for larger platforms.

Exhibit V-30

Factors That Can Inhibit Use of Systems Software Products

Factor	Relative Importance to Users*
Cost	3.2
Data Center Consolidation	3.1
Downsizing	2.9

** 1 = Not Important, 5 = Very Important* *Source: INPUT*

3. Systems Software Products Market, 1995-2000

Exhibit V-31 shows the growth in expenditures for systems software products for workstation/PC equipment is the major growth area.

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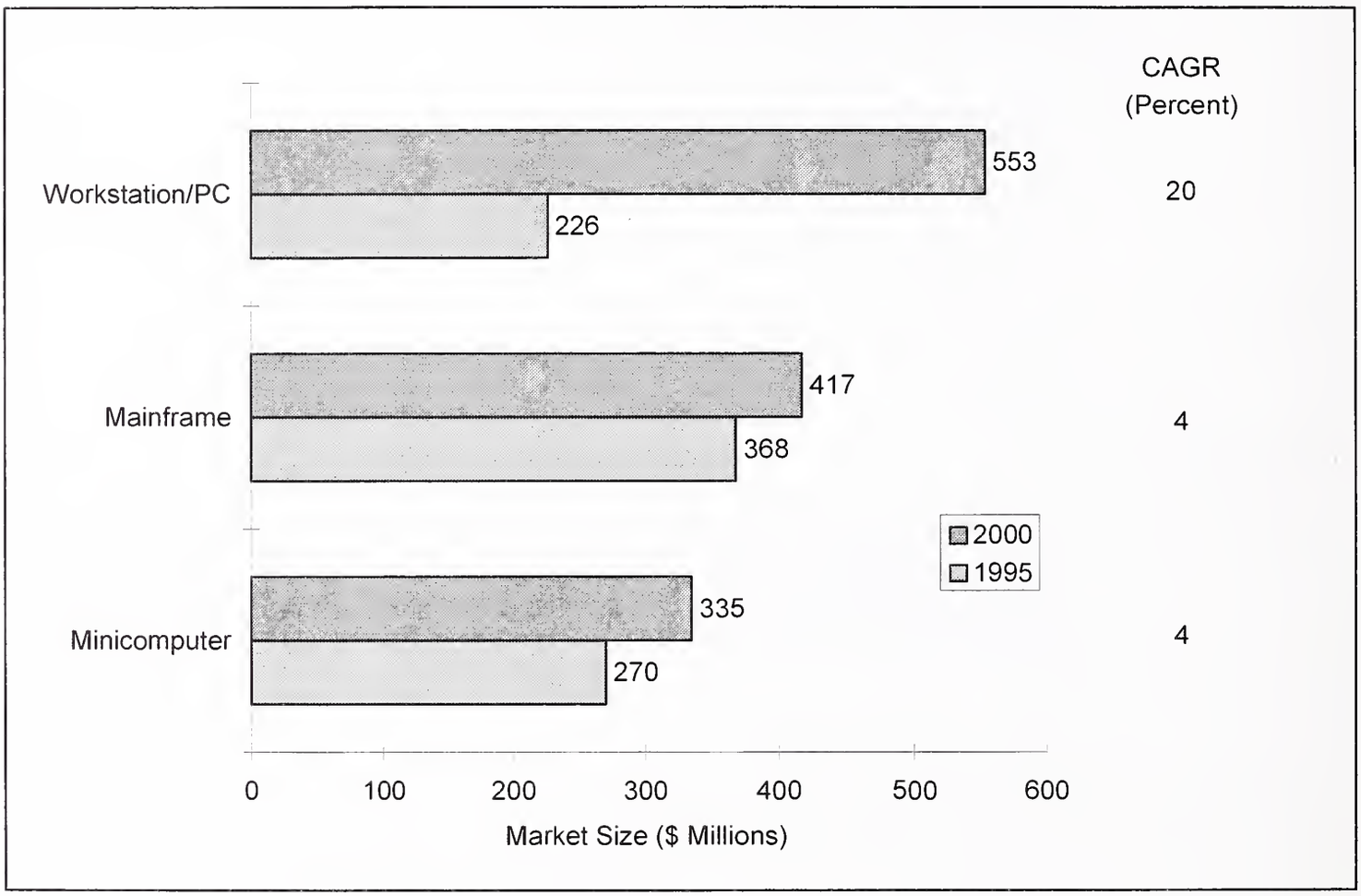
- Expenditures are growing at a CAGR of 20% for workstation/PC systems software products and are responsible for an increase of $327 million in the annual level of expenditures during the five-year period.
- Expenditures for mainframe and minicomputer systems are growing at a significantly smaller rate.

Exhibit V-31

Systems Software Products Submodes, 1995-2000



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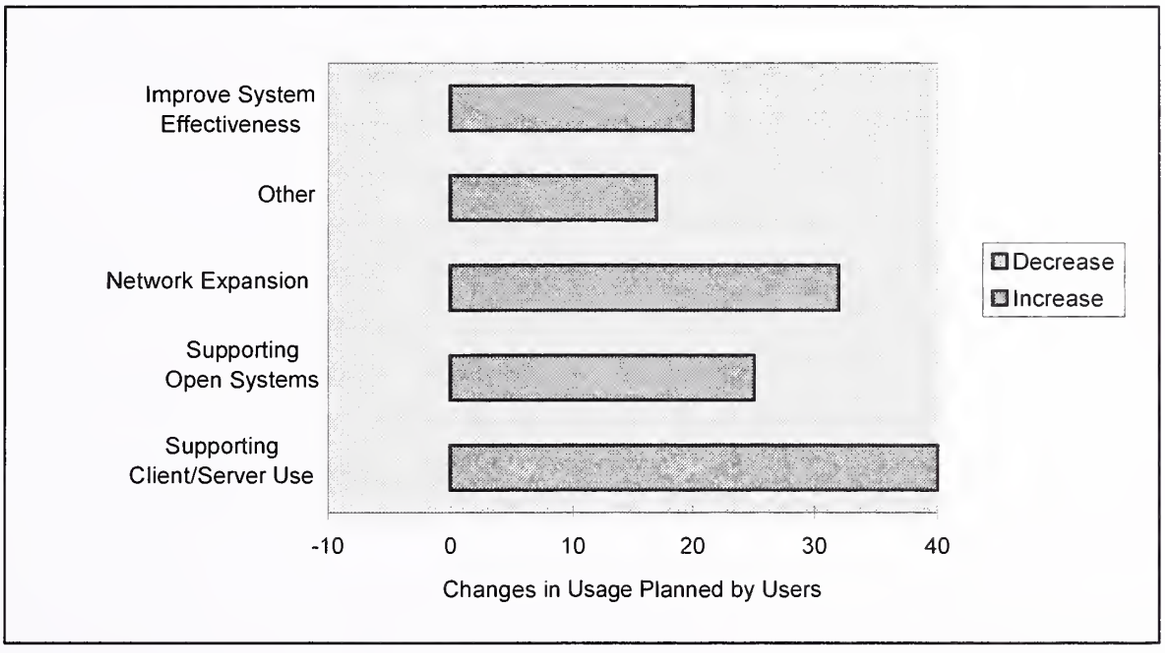
4. Changes in Use of Systems Software Products

The most common increases reported were to support client/server use or network technology, as shown in Exhibit V-32. Most of the network technology-related expenditures were in relation to client/server use.

Exhibit V-32

Use of Systems Software Products Reported by Users



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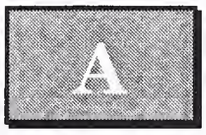

Definition of Terms

A
Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs, in Europe, and for INPUT's worldwide forecasts. The information services industry structure is diagrammed in Exhibit 1.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made, they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

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B
Overall Definitions and Analytical Framework

1. Information Services

Information Services are computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Packaged software products, including systems software or applications software (called *Software Products*)
- A combination of computer equipment, packaged software and associated support services that will meet an application systems need (called *Turnkey Systems*)
- People services that support users in developing and operating their own information systems (called *Professional Services)*
- A combination of products (software and equipment) and services in which the vendor assumes total responsibility for the development of a custom integrated solution, or part of a solution, to an information systems need (called *Systems Integration*)
- Services that provide operation and management of all or a significant part of a user's information systems or telecommunications functions under a long-term contract (called *Outsourcing*)
- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)
- *Network Services* has two components:
  - Services that support the delivery of information in electronic form—typically network-oriented services such as value-added networks and electronic mail (called *Network Applications*)
  - Services that support the access and use of public and proprietary information such as on-line databases and news services (called *Electronic Information Services*)
- Services that support the operation and maintenance of computer and digital communication equipment (called *Equipment Services*)

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In general, the market for information services does not involve providing equipment to users. The exception is when the equipment is part of an overall service offering such as a turnkey system, an outsourcing contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits such as T-1 carriers). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot feasibly be separated from other bundled services (e.g., some outsourcing contracts), the transport costs are included as part of the information services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels; and competitive issues.

2. Market Forecasts/User Expenditures

All information services market forecasts are estimates of user expenditures for information services expressed as *Market Size*. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint—that is, expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems that are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)

- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

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Noncaptive Information Services User Expenditures are expenditures that go to vendors that have a different parent corporation than the user. It is these expenditures, generally regarded as open to competitive bid, that constitute the information services market analyzed by INPUT and that are included in INPUT forecasts.

3. Product/Service Categories

Product/Service Categories are defined as groupings of products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Product/Service Categories* specify *what* the user is buying.

Of the nine product/service categories defined by INPUT, six are considered primary products or services:

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*
- *Equipment Services*

The remaining three product/service categories represent combinations of these products and services, in conjunction with equipment, management and/or other services:

- *Turnkey Systems*
- *Outsourcing*
- *Systems Integration*

Section C describes the product/service categories and their structure in more detail.

4. Market Sectors

Market Sectors, or markets, are groupings of the buyers of information services. There are three types of user markets:

- *Vertical Industry* markets, such as banking and finance, transportation, utilities, etc. These are called "industry-specific" markets.

- *Functional Application* markets, such as human resources, accounting, etc. These are called "cross-industry" markets.

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- *Other markets*, which are neither industry- nor application-specific, such as the market for systems software products and much of the on-line database market.

Specific market sectors used by INPUT are defined in Section E, below.

5. Trading Communities

Information technology is playing a major role in reengineering, not just companies, but the value chain or *Trading Communities* in which these companies operate. This reengineering is resulting in electronic commerce emerging where interorganizational electronic systems facilitate the business processes of the trading community.

- A trading community is the group or organizations—commercial and non-commercial—involved in producing goods or services.

- Electronic commerce and trading communities are addressed in INPUT's Electronic Commerce Program.

6. The Internet

The Internet is expected to be a major, if not the dominant, communications and applications resource of the next millennium. Although in the mid-1990s Internet commercial applications are limited, by the year 2000 the World Wide Web (WWW) and the Internet are expected to be the applications and communications platforms of preference for not only American business, but also for global commerce, personal computing and communications activities. As a platform that facilitates communications between businesses, the Internet will have an impact on each of the nine product/service categories diagrammed in INPUT's information services industry structure chart (Exhibit 1). Internet-related expenditures will be subsets of the appropriate product/service category or subcategory, as determined by their use with or applicability to Internet-based or -related business activities. Because of the ubiquitous nature of the Internet and Internet-related information services spending, no separate Internet definitions will be provided in this *Definitions* book, since, depending upon context, any of INPUT's information services categories could have Internet applicability.

C
Product/Service Categories and Subcategories

Exhibit A-1 provides the overall structure of the information services industry as defined and used by INPUT. This section of the *Definition of*

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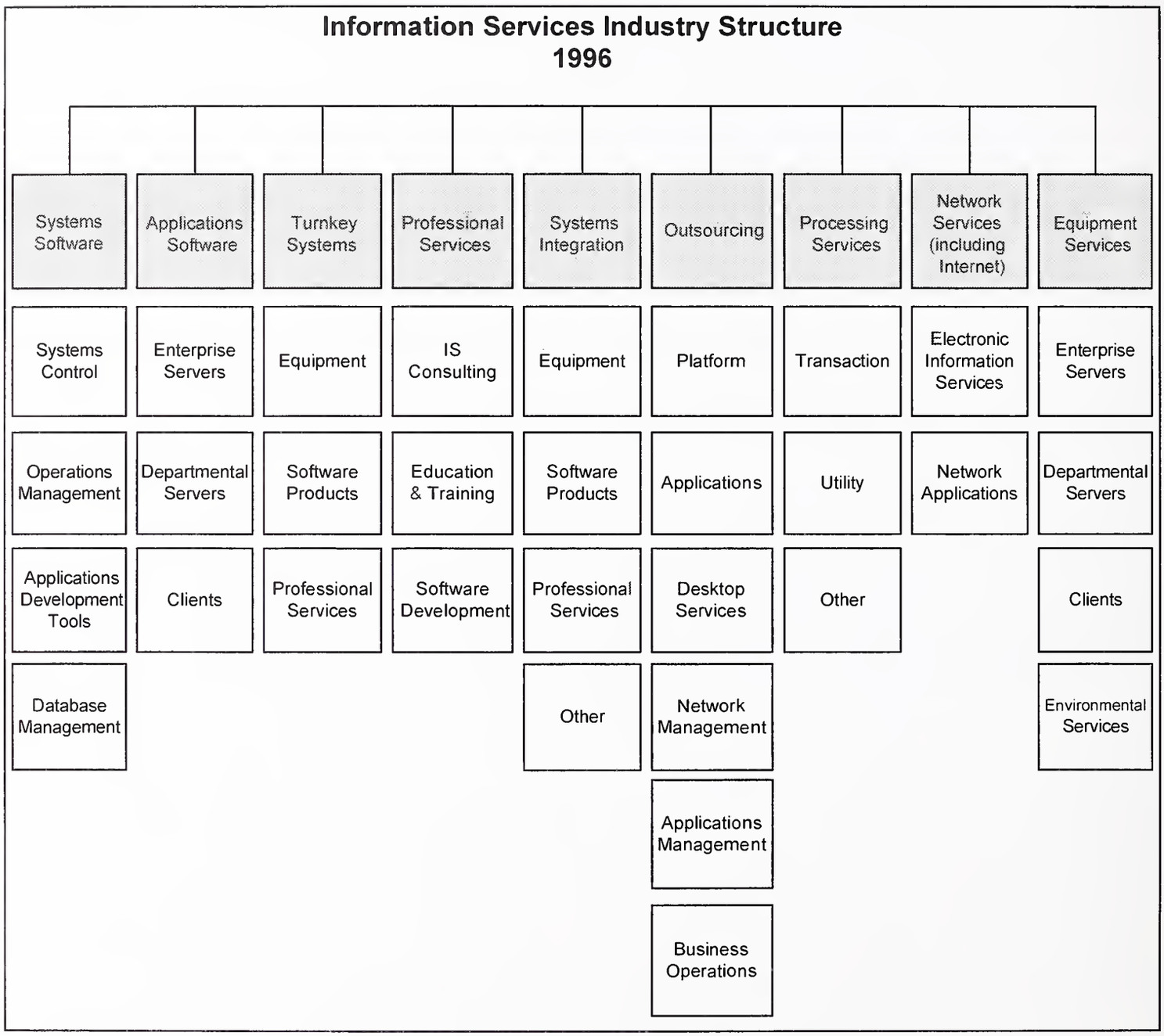
Terms provides definitions for each of the product/service categories and their submodes or components.

Exhibit A-1



Source: INPUT

1. Software Products

INPUT divides the software products market into two product/service categories: systems software and applications software.

The two categories have many similarities. Both involve purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by

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the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if part of the software pricing, is also included here.

Expenditures for work performed by organizations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged separately from the price of the software product itself.

a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. INPUT divides systems software products into four submodes. See Exhibit A-2.

- *Systems Control Products* - Software programs that manage computer system resources and control the execution of programs. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.

- *Operations Management Tools* - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.

- *Applications Development Tools* - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, database management systems, report writers, project control systems, CASE systems and other development productivity aids.

- *Database Management Systems* - Database management systems (DBMSs), data dictionaries and database-related management software

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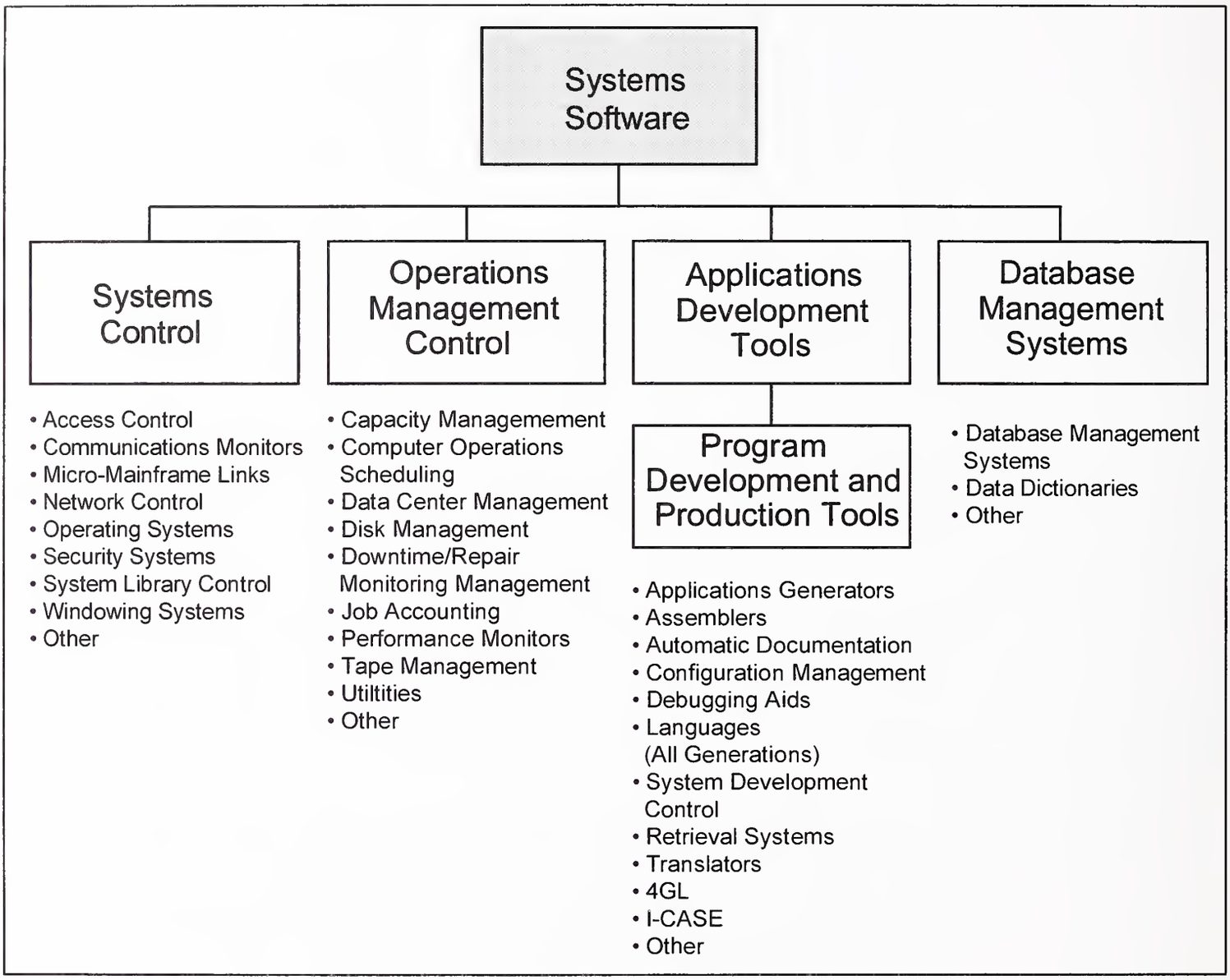
Exhibit A-2

Systems Software Products Market Structure



Source: INPUT

INPUT also forecasts systems software products by platform: mainframe, minicomputer and workstation/PC. These terms reflect a traditional view of processing platforms based upon size or computational capability. In 1996 reports, INPUT will use more contemporary terms for the three platforms based upon functionality, not size or processing power. These will be: enterprise server, departmental server and client.

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b. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups (see Exhibit 3):

- *Industry Specific Applications Software Products* - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (or vertical) market and sold to that market only. Examples include software products to perform such functions as demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.

- *Cross-Industry Applications Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

INPUT also forecasts the applications software product/service category by functional platform: enterprise server, departmental server, and client.

2. Turnkey Systems

A turnkey system integrates equipment (e.g., CPU, peripherals), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT classifies turnkey systems into two groups, as it does for applications software products (see Exhibit A-3)—those systems that are industry-specific and those applicable to the cross-industry markets. Many CAD/CAM systems and small business systems are turnkey systems.

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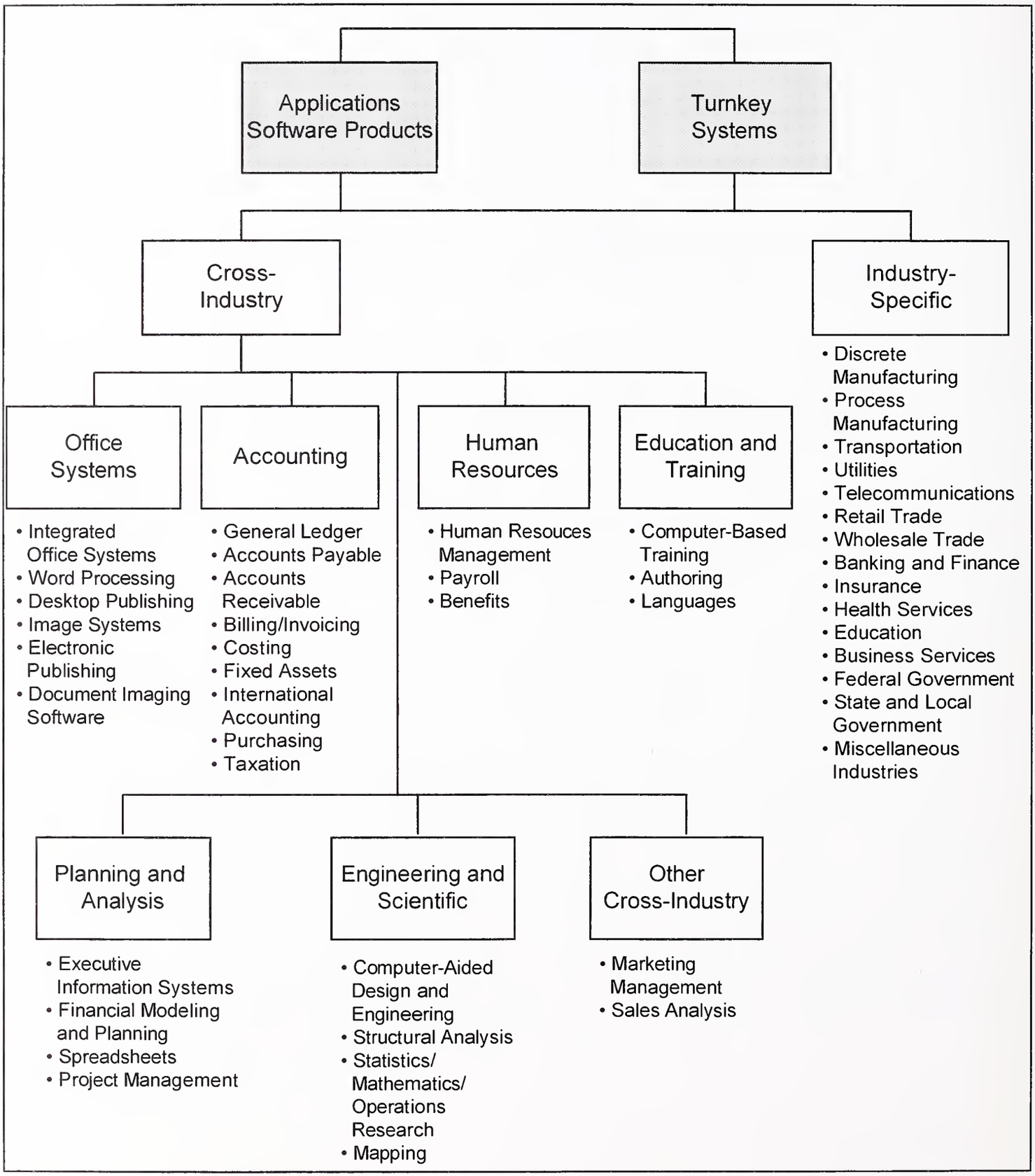
Exhibit A-3

Application Products and Turnkey Systems Market Structure



Source: INPUT

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Computer manufacturers (e.g., IBM or Apple) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers (or VARs) and defined below:

- *Value-Added Reseller (VAR)* - A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also may include many of the other components of a turnkey systems solution, such as professional services, software support, and applications upgrades.

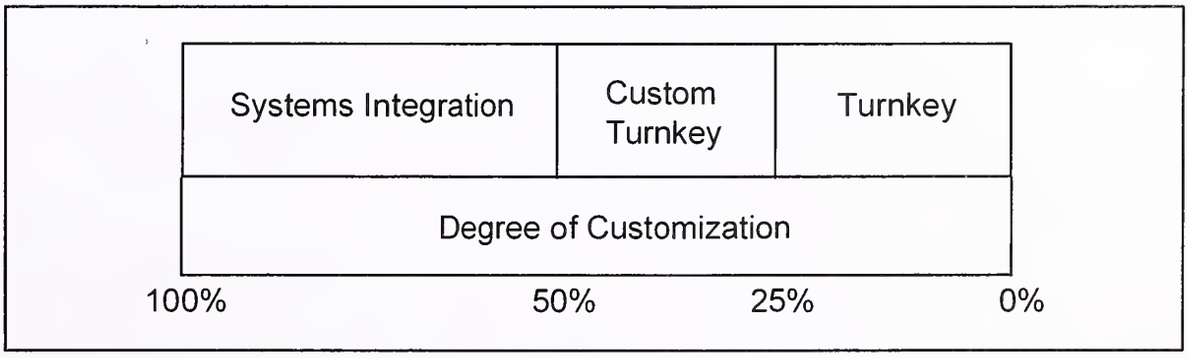
Turnkey systems have three components:

- *Equipment* - computer hardware supplied as part of the turnkey system
- *Software Products* - prepackaged systems and applications software products
- *Professional Services* - services to install or customize the system or train the user, provided as part of the turnkey system sale

Exhibit A-4 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.

Exhibit A-4

The Customization Spectrum



Source: INPUT

3. Processing Services

This product/service category includes three subcategories: transaction processing, utility processing, and "other" processing services. See Exhibit A-5.

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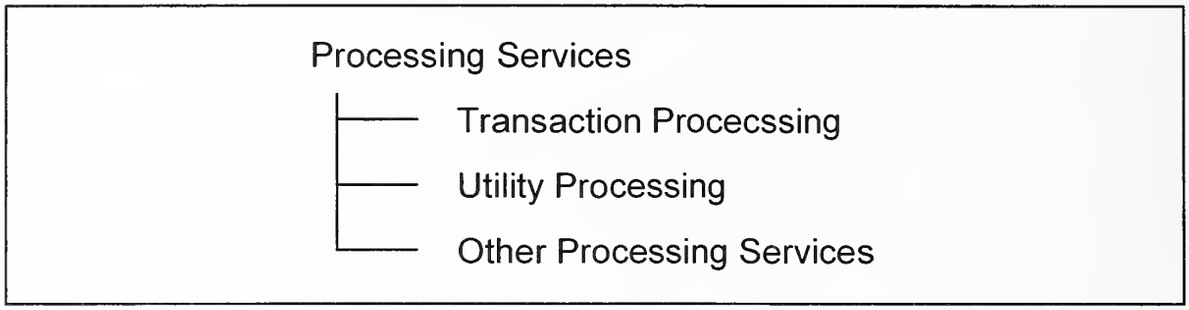
Exhibit A-5

Processing Services Market Structure



Source: INPUT

The three processing services subcategories are:

- *Transaction Processing* - The client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor or customer site to process specific applications and update client databases. The application software is typically provided by the vendor.

- *Utility Processing* - The vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programs or process data on the vendor's system.

- *Other Processing Services* - The vendor provides a service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services. This category also includes backup, contingency and disaster recovery services.

4. Outsourcing

Outsourcing (previously called Systems Operations and Facilities Management) was introduced as a product/service category in the 1990 Market Analysis and Systems Operations programs.

Outsourcing is a long-term (greater than one year) relationship between a client and a vendor in which the client delegates all, or a major portion, of an operation or function to the vendor. The operation or function may either be solely information systems outsourcing-based, or include information systems outsourcing as a major component (at least 30%) of the operation.

The critical components that define an outsourcing service are:

- Delegating an identifiable area of the operation to a vendor

- Single-vendor responsibility for performing the delegated function

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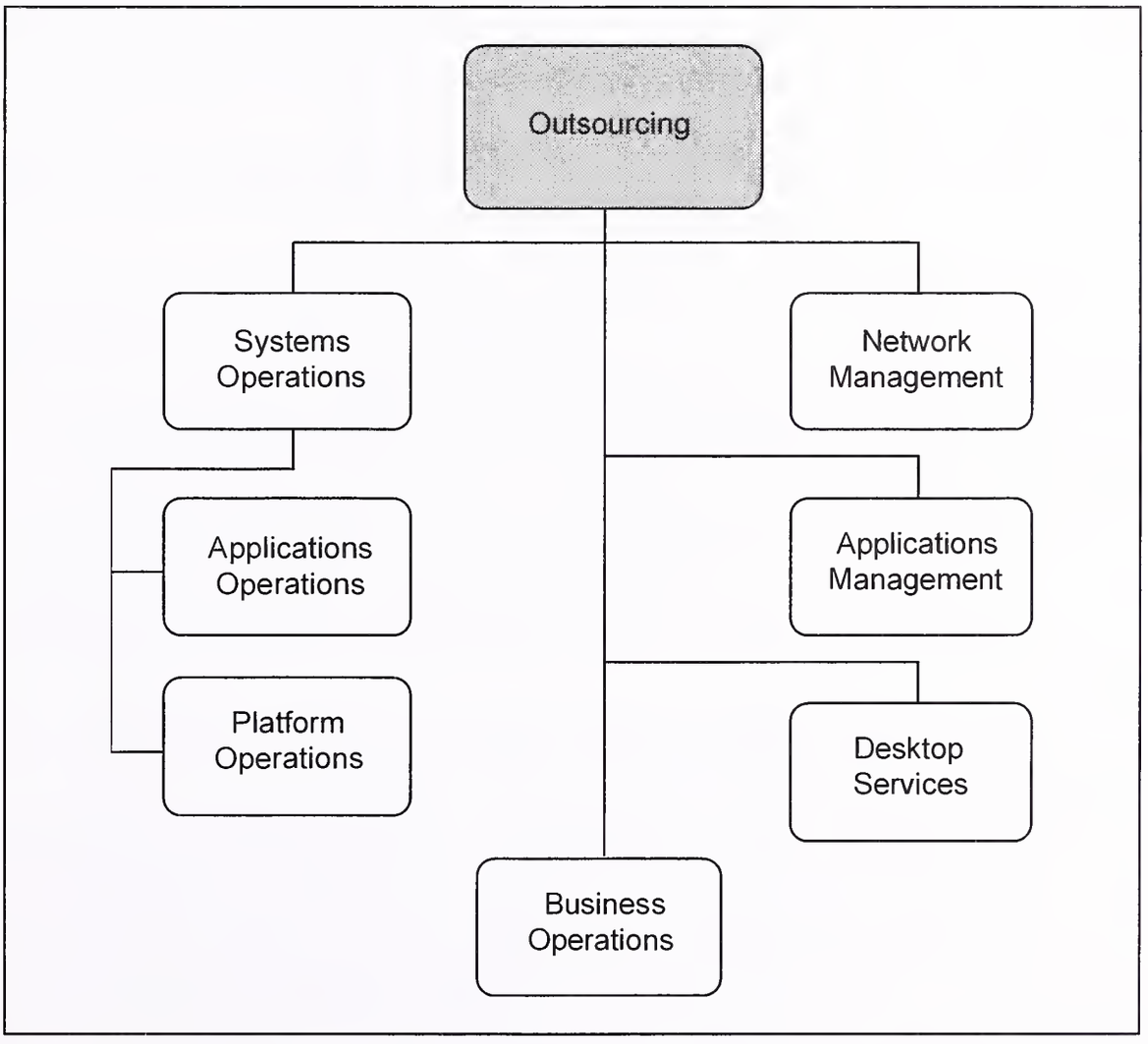
- Intended, long-term relationship between the client and the vendor, where:
  - The contract term is for at least one year
  - The client's intent is not to perform the function with internal resources
- The contract may include non-information systems outsourcing activities, but information systems outsourcing must be an integral part of the contract.

For 1996, the outsourcing product/service subcategories have been defined as shown in Exhibit A-6 and defined below:

Exhibit A-6

Outsourcing Components



Source: INPUT

- *Platform Operations* - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.

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- *Applications Operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

- *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the client's voice communications resources. A network management outsourcing contract may include only the management services or it may cover the full costs of the communications services and equipment plus the management services.

- *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organization. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

  Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

- *Applications Management* - The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may also develop and implement new application systems for the client.

  An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services, the relationship is project based. Under applications management, it is time and function based.

  These services may be provided in combination or separately from platform outsourcing.

- *Business Operations* - Business operations outsourcing (also known as business outsourcing or functional outsourcing) is a relationship in which one vendor is responsible for performing an entire business/operations function, including the information systems outsourcing that supports it. The information systems outsourcing content of such a contract must be at least 30% of the total annual expenditure in order for INPUT to include it in the outsourcing market. Examples of business operations that are outsourced include telephone company billing and employee benefits processing.

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Outsourcing vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the federal government market, systems operation services are also defined by equipment ownership with the terms "COCO" (Contractor-Owned, Contractor-Operated), and "GOCO" (Government-Owned, Contractor-Operated).

5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking, or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.

The components of a systems integration project (see Exhibit A-7) are the following:

- *Equipment* - The information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.

- *Software Products* - Prepackaged applications and systems software products.

- *IT-Related Professional Services* - The value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and, if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and outsourcing and maintenance.

- *Other Products and Services* - Most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

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Exhibit A-7

Products and Services Included in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

IT Related Professional Services

- Consulting
  - Feasibility and trade-off studies
  - Selection of equipment, network and software
- Program/project management
- Design/integration
  - Systems design
  - Installation of equipment, network, and software
  - Demonstration and testing
- Software development
  - Modification of software packages
  - Modification of existing software
  - Custom development of software
- Education/training and documentation
- Systems operation/maintenance

Other Miscellaneous Products/Services

- Site preparation
- Data processing supplies
- Processing/network services
- Data/voice communication services

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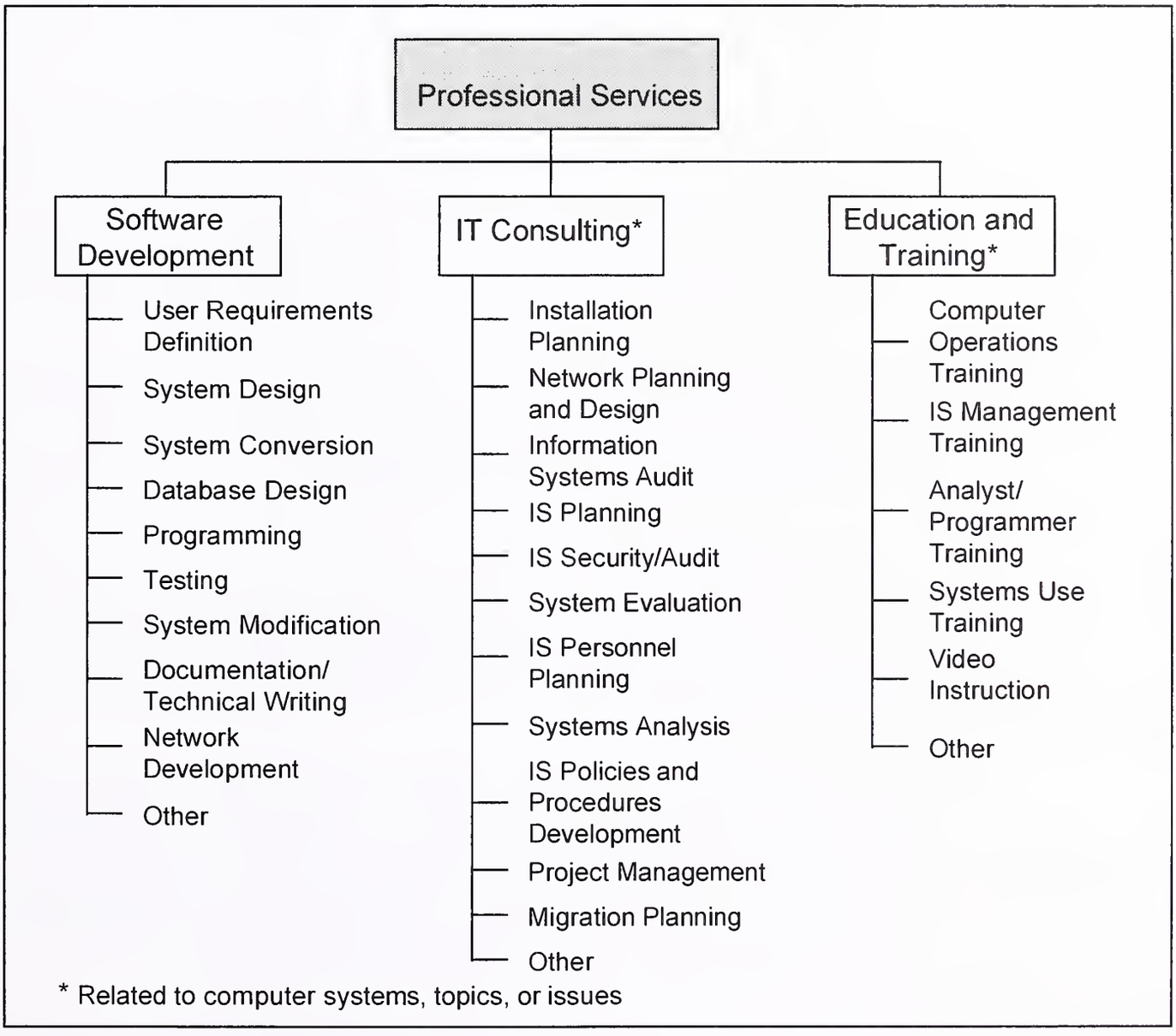
6. Professional Services

This product/service category includes three subcategories: consulting, education and training, and software development. Exhibit A-8 provides additional detail.

Exhibit A-8

Professional Services Market Structure



Source: INPUT

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The three subcategories are defined as follows:

- *IT Consulting* - Services include information technology consulting (related only to information systems, and not general business consulting) in a broad range of areas, including planning, design, audit, evaluation and analysis; information systems re-engineering; feasibility analysis and cost-effectiveness studies; and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and outsourcing.

- *Education and Training* - Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems is not included. General education and training products are included as a cross-industry market sector.

- *Software Development* - Services include user requirements definition, systems design, contract programming, documentation, and implementation of software, performed on a custom basis. Conversion and maintenance services are also included.

7. Network Services

Network services include a variety of telecommunications-based functions and operations, including those related to the Internet. This category includes two subcategories, as diagrammed in Exhibit A-9. Each is defined in greater detail below.

Electronic Information Services - Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including topics such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, and automobile valuations. The terminals used may be computers themselves, such as communications servers or personal computers.

Users inquire into and extract information from the databases and they may load extracted data into their own computer systems. The vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's databases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

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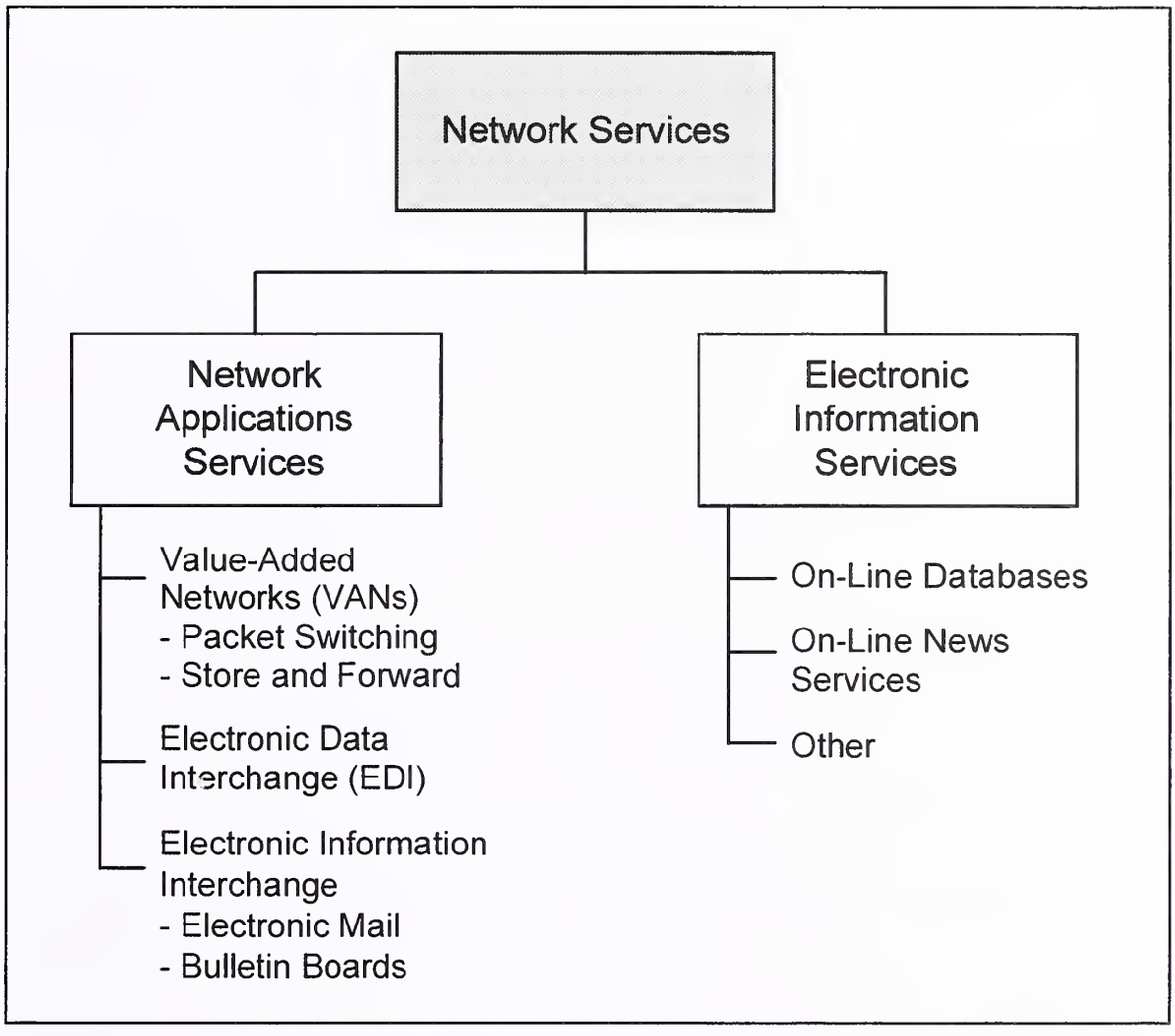
Exhibit A-9

Network Services Market Structure



Source: INPUT

The two major categories of electronic information services are:

- *On-line Databases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.

- *On-line News (Text) Services* - Unstructured, primarily textual information on people, companies, events, etc. These are most often news services.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM (optical disks) to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

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Network Applications Services - The three types of network applications services are:

- *Value-Added Network Services (VAN Services)* - VAN services are enhanced transport services that involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

  VAN services were originally provided only by specialized VAN carriers (e.g., Tymnet and Telenet); today, these services are also offered by traditional common carriers (e.g., AT&T and Sprint). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

- *Electronic Data Interchange (EDI) Services*- Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

- *Electronic Information Interchange*- The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

8. Equipment Services

The equipment services product/service category includes two subcategories. Both deal with the support and maintenance of computer equipment.

- *Equipment Maintenance* - Services provided to repair, diagnose problems, and provide preventive maintenance both onsite and offsite for computer equipment. The costs of parts and other supplies are excluded. These services typically are provided on a contract basis. Equipment is divided into three broad groupings, depending upon function: enterprise servers, departmental servers, and clients. These functional definitions replace INPUT's earlier platform-related categories of mainframe, minicomputer, and workststation/PC, respectively.

- *Environmental Services* - These services comprise equipment and data center-related special services such as cabling, air conditioning and power supply, equipment relocation, and similar services.

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D
Computer Equipment

These definitions have been included to provide the basis for market segmentation in the software products markets.

- *Computer Equipment* - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).

- *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be channel-connected to a processor, and generally cannot be included in other categories such as terminals

- *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters

- *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters

- *Communication Devices* - Includes modems, encryption equipment, special interfaces, and error-control devices.

- *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), bubble and optical memories, and mass storage devices

- *Computer Systems* - Includes all processors, from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional. This category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.

- *Personal Computers* (PCs) - Smaller computers using 8-, 16-, or 32-bit computer technology, generally designed as desktop or laptop devices—e.g., to sit on a desktop or as a portable for individual use. Prices are generally less than $3,000. These devices form the bulk of the clients in a client/server environment.

- *Workstations* - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as

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database access, file storage and backup, remote communications, and peripheral support. These products usually cost from $5,000 to $15,000.

- *Departmental Servers* - These are generally minicomputers or midsized computers priced from $5,000 to $350,000. Many client/server computers are in this category.

- *Enterprise Servers* - Traditional mainframe and supercomputers costing more than $350,000.

- *Client/server computing* - Client/server is an architecture that assembles applications software and databases, systems software, and computer and networking equipment into a usable form for the purpose of leveraging information technology investments. Broadly defined, it can include any kind of server, such as file servers and network servers, that are accessed by any kind of client, including a nonintelligent terminal. INPUT has elected to use the narrower and newer definition, by which application and data processing is shared between a client and a server. It is through the act of sharing that the greatest benefit is derived in terms of leveraging information technology investments. It is also the cause of the greatest change for vendors and users. As noted above, using client/server terminology, computers can be segmented into three broad categories—enterprise servers, departmental servers and clients—roughly corresponding to the platform categories: mainframes, minicomputers and workstation/PCs.

E
Sector Definitions

1. Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the most recent revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit A-10.

INPUT includes all product/service categories except systems software products and equipment services in industry market sectors.

Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.

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Exhibit A-10

Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing, and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetallic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)

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Exhibit A-10 (continued)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Trade	52xx 53xx 54xx 55xx 56xx 57xx 58xx 59xx	Building materials General merchandise stores Food stores Automotive dealers, gas stations Apparel and accessory stores Home furniture, furnishings and accessory stores Eating and drinking places Miscellaneous retail
Wholesale Trade	50xx 51xx	Wholesale trade - durable goods Wholesale trade - nondurable goods
Banking and Finance	60xx 61xx 62xx 67xx	Depository institutions Nondepository credit institutions Security and commodity brokers, dealers, exchanges and services Holding and other investment offices
Insurance	63xx 64xx	Insurance carriers Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services

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Exhibit 10 (continued)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amuserment and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors

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2. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc. In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.

INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.

The seven cross-industry markets are:

a. Accounting

Accounting consists of applications software products and information services that serve such functions as:

- General ledger
- Financial management
- Accounts payable
- Accounts receivable
- Billing/invoicing
- Fixed assets
- International accounting
- Purchasing
- Taxation
- Financial consolidation

Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

b. Human Resources

Human resources consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

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- Employee relations
- Benefits administration
- Government compliance
- Manpower planning
- Compensation administration
- Applicant tracking
- Position control
- Payroll processing

c. Education and Training

Education and training consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system, or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

d. Office Systems

Office systems consists of the following six categories:

(1) *Integrated Office Systems (IOSs)* - IOSs integrate the applications that perform common office tasks. Typically, these tasks include the following core applications, all of which are accessed from the same terminal, microcomputer, or workstation:

- Electronic mail
- Decision support systems
- Time management
- Filing systems

IOSs enable office workers to utilize applications that are resident on a number of hosts or servers, thus creating a corporate communication environment through integrating line-of-business software with personal software productivity tools. IOSs capitalize on the cross-platform architectures of major vendors. Major hardware vendors such as IBM, Data General, Digital, Hewlett-Packard and NCR all offer IOSs.

Workflow and groupware products are also included within the IOS definition.

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(2) *Word Processing* - Word processing is the most common microcomputer application and is a basic application within the office systems sector. Word processing addresses several levels of functionality, from the production of simple correspondence to large document generation in which many people from different departments have input.

(3) *Desktop Publishing (DTP)* - Desktop publishing refers to the page-design software programs that allow small and midsized organizations to publish printed documents (brochures, catalogs, newsletters, reports, etc.) from the desktop. The primary functions of DTP software include the manipulation of the following functions:

- Layout and design of columns
- Text manipulation (font type)
- Graphic manipulation
- Print Control (color type, paper type)

(4) *Electronic Publishing* - Electronic publishing includes composition, printing, and editing software for documents containing multiple typefaces and graphics, including charts, diagrams, computer-aided design (CAD) drawings, line art, and photographs. Electronic publishing products may also have different data formats such as text, graphs, images, voice and video.

The fundamental difference between electronic publishing and desktop publishing is that electronic publishing facilitates document management and control from a single point, regardless of how many authors/locations work on a document. Desktop publishing (DTP), on the other hand, is considered a personal productivity tool and is generally a lower-end product residing on a personal computer.

(5) *Graphics* - Graphics packages that are used for presentations or freehand drawings and/or are ancillary to desktop publishing are part of office systems. Thus, the graphics component of office systems sector includes the following elements:

- *Presentation graphics* represent the bulk of office systems graphics. Most presentations involve a combination of graphs and text. They are used to communicate a series of messages to an audience rather than to analyze data.
- *Paint and line art drawing programs* are used for illustrations, while page layout programs are used to integrate text and graphics.

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- *Electronic form programs* allow users to create and print forms in-house. Some applications work with OCR scanners, allowing users to scan pictures and logos directly onto forms.

(6) *Document Imaging Software* - The software that allows users to manipulate (store, retrieve, print) images that have been scanned from paper documents. The applications that imaging software generates include: full text retrieval, document management, and database management. Document imaging software is a component of an imaging system. Hardware components of imaging systems include: scanners, image servers, workstations, optical drives, printers, and storage devices.

e. Engineering and Scientific

Engineering and scientific activities encompass the following applications:

- Computer-aided design and engineering (CAD and CAE)
- Structural analysis
- Statistics/mathematics/operations research
- Mapping/GIS
- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector, as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

f. Planning and Analysis

Planning and analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)
- Financial modeling or planning systems
- Spreadsheets
- Project management

g. Sales and Marketing

Sales and marketing encompasses the following marketing/sales applications:

- Sales analysis
- Marketing management

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- Demographic market planning models

3. Product/Service Category Reporting by Sector

This section describes how the product/service forecasts relate to the market sector forecasts. Exhibit A-11 summarizes the relationships.

- *Processing Services* The transaction processing services subcategory is forecasted for each industry and cross-industry market sector. The utility and other processing services subcategories are forecasted in total in the general market sector.

- *Turnkey Systems* Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.

- *Applications Software Product* Applications software products are forecast for the 15 industry and 7 cross-industry sectors.

- *Outsourcing* Each of the outsourcing subcategories is forecasted for each of the 15 industry sectors.

- *Systems Integration* Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.

- *Professional Services* Professional services and each of its subcategories are forecasted for each of the 15 industry sectors.

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Exhibit A-11

Product/Service Category versus Market Sector Forecast Content

Product/Service Category	Product/Service Subcategory	Industry Sectors	Cross-Industry Sector	General
Processing Services	Transaction	✔	✔	
	Utility			✔
	Other			✔
Turnkey Systems		✔	✔	
Applications Software Products		✔	✔	
Outsourcing	Platform Ops.	✔		
	Application Ops.	✔		
	Desktop Svcs.	✔		
	Network Svcs.	✔		
	ApplicationsMgmt.	✔		
	Business Ops.	✔		
Systems Integration		✔		
Professional Services		✔		
Network Services	Network Appls.	✔		
	Electronic Info. Svcs.	✔		✔
Systems Software Products				✔
Equipment Svcs.				✔

Source: INPUT

- *Network Services* - The network applications subcategory of network is services forecasted for each of the 15 industry sectors. Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

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- *Systems Software Products* - Systems software products are forecasted in total for the general market sector.

- *Equipment Services* - Equipment services and its subcategories are forecasted in total in the general market sector.

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B

Respondent Profile

Exhibit B-1

Respondent Profile

Market Sector	Number of User Respondents
Process Manufacturing	15
Finance and Banking	13
Other, including Government	13
Insurance	12
Discrete Manufacturing	11
Wholesale Trade	11
Utilities	9
Telecommunications	7
Business Services	5
Retail Trade	5
Total	145

Source: INPUT

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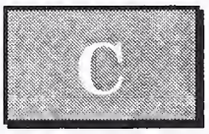

Forecast Database and Reconciliation

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Exhibit C-1

Canadian Information Services Industry 1995 Database

Delivery Modes	1994 ($M)	GROWTH 94-95 (%)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	2000 ($M)	CAGR 95-00 (%)
Total Sector - Canadian Information Services Mkt.	7,424	16	8,631	9,843	11,278	12,889	14,842	17,090	15
Processing Services	783	7	839	900	966	1,028	1,102	1,179	7
- Transaction Processing	483	8	522	564	609	650	700	750	8
- Utility Processing	247	3	255	264	272	280	287	294	3
- Other	53	17	62	72	85	98	115	135	17
Network/Electronic	334	18	393	460	536	614	705	825	16
- Electronic Info Services	120	17	140	163	187	214	240	280	15
- Network Applications	214	18	253	297	349	400	465	545	17
Application SW Products	885	12	992	1,115	1,256	1,421	1,613	1,836	13
- Mainframe	213	6	226	236	246	257	268	281	4
- Minicomputer	252	6	266	281	295	310	325	335	5
- Workstation/PC	420	19	500	598	715	854	1,020	1,220	20
System SW Products	790	9	864	936	1,016	1,100	1,197	1,305	9
- Mainframe	348	6	368	379	391	400	409	417	3
- Minicomputer	252	7	270	285	299	312	325	335	4
- Workstation/PC	190	19	226	272	326	388	463	553	20
Turnkey Systems	350	5	366	384	402	421	436	454	4
- Equipment	109	4	113	117	121	125	127	129	3
- Software Products	198	5	207	218	228	238	247	258	5
- Professional Services	43	7	46	49	53	58	62	67	8
Systems Integration	914	10	1,005	1,104	1,215	1,341	1,510	1,660	11
- Equipment	358	8	387	419	454	493	532	570	8
- Software Products	172	9	187	203	222	244	272	302	10
- Professional Services	342	13	387	435	490	552	651	731	14
- Other	42	5	44	47	49	52	55	57	5
Outsourcing	1,895	25	2,526	3,107	3,834	4,684	5,739	7,011	23
- Platform Operations	900	39	1,250	1,550	1,950	2,420	3,010	3,760	25
- Application Operations	230	16	267	311	362	420	489	560	16
- Desktop Services	210	22	256	312	380	463	562	685	22
- Network Management	190	23	233	289	352	431	528	646	23
- Business Operations	365	42	520	645	790	950	1,150	1,360	21
Professional Services	1,473	12	1,646	1,837	2,053	2,280	2,540	2,820	11
- IS Consulting	541	13	611	690	780	870	975	1,085	12
- Software Development	666	11	737	814	900	995	1,100	1,215	11
- Education & Training	266	12	298	333	373	415	465	520	12

Source: INPUT

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Exhibit C-2

Canadian Information Services Industry 1995 Database Reconciliation

Delivery Modes	1994 Market				1999 Market				94-99 CAGR	94-99 CAGR
	1994 Report	1995 Report	Variance from 1994 Report		1994 Report	1995 Report	Variance from 1994 Report		per data 94 Rpt.	per data 95 Rpt.
	(Fcst) ($M)	(Fcst) ($M)	($M)	(%)	(Fcst) ($M)	(Fcst) ($M)	($M)	(%)	(%)	(%)
Sector Total	6,354	7,424	1,070	16	10,999	14,705	3,706	34	11	15
Processing Services	784	783	(1)	5	1,124	1,102	(22)	2	7	7
Turnkey Systems	348	350	2	0	434	436	2	0	5	4
Application SW Products	884	885	1	0	1,560	1,613	53	3	12	13
Outsourcing	830	1,895	1,065	128	1,933	5,739	3,806	197	18	23
Systems Integration	914	914	0	0	1,510	1,510	0	0	11	11
Professional Services	1,474	1,473	(1)	0	2,545	2,540	(5)	0	12	11
Network Services	334	334	0	0	705	705	0	0	16	16
Systems SW Products	786	790	4	1	1,148	1,060	(88)	(8)	8	9

Source: INPUT

Variances for most delivery modes are very small. The most significant variance from the 1994 forecast is for outsourcing services. This is due to the inclusion of the new category of outsourcing, business operations, as well as to the surge of interest in platform operations.

There is also a fall off in systems software expenditures forecast for 1999 due to the shrinkage in mainframe usage now being forecast.

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